FLOOD INSURANCE STUDY

CANADIAN COUNTY, OKLAHOMA

AND INCORPORATED AREAS

VOLUME 1 OF 3

Community Name	Community Number
CALUMET, TOWN OF	400268
EL RENO, CITY OF	405377
GEARY, CITY OF	400381
MUSTANG, CITY OF	400409
*OKARCHE, TOWN OF	400428
OKLAHOMA CITY, CITY OF	405378
PIEDMONT, CITY OF	400027
UNION CITY, TOWN OF	400334
YUKON, CITY OF	400028
CANADIAN COUNTY UNINCORPORATED AREAS	400485

*NO SPECIAL FLOOD HAZARD AREAS

PRELIMINARY DATE:
February 15, 2017

Federal Emergency Management Agency

FLOOD INSURANCE STUDY NUMBER
40017CV001C

NOTICE TO
FLOOD INSURANCE STUDY USERS

Communities participating in the National Flood Insurance Program have established repositories of flood hazard data for floodplain management and flood insurance purposes. This Flood Insurance Study may not contain all data available within the repository. It is advisable to contact the community repository for any additional data.

Part or all of this Flood Insurance Study may be revised and republished at any time. In addition, part of this Flood Insurance Study may be revised by the Letter of Map Revision process, which does not involve republication or redistribution of the Flood Insurance Study. It is, therefore, the responsibility of the user to consult with community officials and to check the community repository to obtain the most current Flood Insurance Study components. A listing of the Community Map Repositories can be found on the Index Map.

Initial Countywide FIS Effective Date: January 19, 2000

First Revised Countywide FIS Date: July 2, 2002

Second Revised Countywide FIS Date: September 26, 2008

Third Revised Countywide FIS Date: TBD

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FLOOD INSURANCE STUDY
CANADIAN COUNTY, OKLAHOMA AND INCORPORATED AREAS

1.1 INTRODUCTION

1.2 Purpose of Study

This Flood Insurance Study revises and updates information on the existence and severity of flood hazards in the geographic area of Canadian County, including the Cities of El Reno, Geary, Mustang, Oklahoma City, Piedmont, and Yukon; the Towns of Calumet, Okarche, and Union City; and the unincorporated areas of Canadian County (referred to collectively herein as Canadian County), and aids in the administration of the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. This study has developed flood- risk data for various areas of the community that will be used to establish actuarial flood insurance rates and to assist the community in its efforts to promote sound floodplain management.

Minimum floodplain management requirements for participation in the National Flood Insurance Program (NFIP) are set forth in the Code of Federal Regulations at 44 CFR, 60.3.

Please note that the City of Geary is geographically located in Blaine and Canadian Counties. The City of Piedmont and Town of Okarche are both located in Canadian and Kingfisher Counties. The City of Oklahoma City is located in Oklahoma, Canadian, Cleveland, McClain, and Pottawatomie Counties.

In some states or communities, floodplain management criteria or regulations may exist that are more restrictive or comprehensive than the minimum Federal requirements. In such cases, the more restrictive criteria take precedence and the State (or other jurisdictional agency) will be able to explain them.

1.3 Authority and Acknowledgments

The sources of authority for this Flood Insurance Study are the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973.

The hydrologic and hydraulic analyses for the original study of the City of Mustang were prepared by the U.S. Geological Survey (USGS) for the Federal Emergency Management Agency (FEMA), under Interagency Agreement No. IAA-H-9-77, Project Order No. 3. The work was completed in July 1978.

Updated hydraulic analyses for Mustang Creek Tributary 1 and East Branch Mustang Creek Tributary 1 were prepared by Dewberry and Davis under the direction of FEMA. The work for the revision was completed in July 1989.

The hydrologic and hydraulic analyses for the City of Piedmont study were performed by the USGS, Water Resources Division, Oklahoma City, for FEMA, under Interagency Agreement No. IAA-H-876, Project Order No. 9. This work was completed in January 1980 and covered all significant flooding sources in the City of Piedmont.

Cross-section data for the City of Piedmont were collected and compiled by Spitz Aero Photogrammetric Engineers, under subcontract from the USGS.

The hydrologic and hydraulic analyses for the City of Yukon study were performed by the U.S. Army Corps of Engineers (USACE), Tulsa District, for the Federal Insurance Administration (FIA), under Interagency Agreement Nos. IAA-H-16-75, Project Order No. 19, and IAA-H-7-76, Project Order No. 1. This work, which was completed in December 1977, covered all significant flooding sources in the City of Yukon.

The Oklahoma County study was revised on March 17, 1997, to update floodplain information for the Canadian River that affects Oklahoma City. The Canadian River was restudied by detailed methods as part of the Flood Insurance Study for Cleveland County, Oklahoma (Reference 1).

The hydraulic analysis for the Oklahoma City study for Mustang Creek Tributary 3 East Branch was updated by Clowers Engineering Company; a second update to the hydraulic analysis for Tributary 0 of Canadian River Tributary 1 was performed by Design Engineers, Inc., and a second update to the hydraulic analysis for Spring Creek West Branch was performed by Davila Engineering Company. The revisions were completed in April 1985.

The study for the City of Piedmont was revised on November 5, 1997, to incorporate new and revised data for Soldier Creek South Branch, from approximately 2,000 feet upstream of Mustang Road to approximately 3,000 feet upstream of Piedmont Road, Deer Creek Tributary 5A, from Washington Street to approximately 2,000 feet upstream of Piedmont Road, and Deer Creek Tributary 5, from Washington Street upstream to First Street.

The hydrologic and hydraulic analyses for this restudy were performed by the USACE, Tulsa District, for FEMA, under Interagency Agreement No. EMW-94-E-4432, Project Order No. 5.

This study was revised on January 19, 2000, to convert the Flood Insurance Rate Maps, Flood Hazard Boundary Maps, and Flood Insurance Study reports for Canadian County and Incorporated Areas into the countywide format. Table 4, which lists the dates of publication of those Flood Insurance Rate Maps and Flood Hazard Boundary Maps, was added to this Flood Insurance Study report as part of this update. In addition, the mapping for the new countywide Flood Insurance Rate Map was converted to digital format.

This study was revised on July 2, 2002, to incorporate revised detailed flooding hazard information for North Canadian River Tributary A, Main Stem Turtle Creek, Turtle Creek East Branch with Cornwell Tributary, Middle Branch Turtle Creek with Holly Branch of Middle Branch Turtle Creek and Turtle Creek West Branch. New detailed flood hazard information was added for North Canadian River Tributary B and North Canadian River Tributary C. All areas of study are within the corporate limits of the City of Yukon.

The hydrologic and hydraulic analyses for September 26, 2008 study were performed by The Benham Group, for the Federal Emergency Management Agency (FEMA), under Contract No. EMT- 98-CO-0017. This restudy was completed in August 1999.

The September 26, 2008 countywide study was revised to incorporate the results of approximate and redelineated hydrologic and hydraulic analyses for various flooding sources within Canadian County. The revisions included the addition of streams from Oklahoma City that lie within the borders of Canadian County. The analyses were performed by Watershed VI Alliance, for FEMA, under Contract No. EMT-2002-CO-0048, Task Order J024, in a study completed in June 2006.

For this revision to the countywide study, the hydrologic and hydraulic analyses for Deer Creek Tributary 5, Soldier Creek, Soldier Creek North Branch and Soldier Creek North Branch Tributary were performed using elevations derived using the most detailed topographic data available for this study are the Light Detection and Ranging (LiDAR) data obtained from the communities in Oklahoma. The 1/3 Arc Second NED Digital Elevation Models (DEMs) were downloaded from U.S. Geological Survey and were used to provide coverage for the missing areas. This work was performed by RAMPP for Task Order HSFE06-12-J-0001 under FEMA IDIQ Contract HSFEHQ-09-D-0369 for Lower Cimarron Skeleton Watershed, Oklahoma and completed in March 2016.

1.4 Coordination

In November 1975, an initial Consultation Coordination Officer (CCO) meeting for the City of Mustang was held with representatives from FEMA, the City, and the USGS (the study contractor) to determine the streams to be studied by detailed methods.

On May 14, 1979, a final CCO meeting for the City of Mustang was held with representatives from FEMA, the City, and the study contractor to review the results of the original study.

Streams requiring detailed study in the City of Piedmont were presented during an initial CCO meeting held on May 13, 1976. Personnel from the USGS and FEMA attended the meeting. Also in attendance representing the City of Piedmont was the Honorable Darrel Stinchcomb, Mayor, City of Piedmont.

On March 18, 1980, a meeting was held between a representative of the USGS and the Honorable James Martin, Mayor, City of Piedmont. The purpose of the meeting was to determine the current corporate boundaries of the City of Piedmont for use in the study.

Basic data and topographic maps, with 10-foot contour intervals, from the USGS were used for the City of Piedmont study (Reference 2).

On February 23, 1981, the results of the studies performed by the USGS were reviewed at a final CCO meeting attended by representatives of the USGS, FEMA, and the City of Piedmont.

On December 19, 1974, a prestudy meeting was held for the City of Yukon. Attendees included representatives of the City, the FIA, and the USACE, Tulsa District. Streams requiring detailed study were identified at a meeting attended by representatives of the USACE and local authorities. Yukon City officials were briefed periodically as to the study progress. The final coordination meeting was held in the City of Yukon on September 19, 1978.

On May 12, 1976, streams requiring detailed study were identified at an initial CCO meeting attended by representatives of FEMA, USGS, the study contractor, and the City of Oklahoma City. Continuous informal communication was maintained with Oklahoma City officials throughout the course of the study. Information used in the study was coordinated with USACE.

On January 18, 1978, a meeting was held between personnel of USGS and the City of Oklahoma City Planning Department. The purpose of this meeting was to report on the status of the study and to explain the methodology used for the study.

The results of the November 5, 1997 Piedmont restudy were reviewed at the final CCO meeting held on August 14, 1996, and attended by representatives of FEMA and the City of Piedmont. All problems raised at that meeting have been addressed in the restudy.

The results of the January 19, 2000 conversion of the Canadian County maps to a countywide format were reviewed at a final CCO meeting held on December 16, 1998, and attended by representatives of FEMA, the Cities of El Reno, Mustang, and Yukon, the Town of Calumet, Canadian County, and the Oklahoma Water Resources Board.

For the July 2, 2002 City of Yukon restudy, an initial Consultation Coordination Officer (CCO) meeting was held on May 5, 1998, and attended by representatives of the City of Yukon, FEMA and the study contractor.

Contacts were made with the following for the purposes of acquiring information relevant to the Yukon restudy: U.S. Geological Survey (USGS); U.S. Army Corps of Engineers (USACE), Tulsa District; City of Yukon, Chamber of Commerce, Public Library, and Public Works Department; The Yukon Review; Oklahoma Historical Society; and Michael Baker Jr., Inc.

The results of the City of Yukon restudy were reviewed at the final CCO meeting held on August 9, 2001, and attended by representatives of FEMA and Canadian County, the Cities of El Reno, Mustang, Piedmont, and Yukon; and the Towns of Calumet and Union City. All problems raised at that meeting have been addressed in this study.

2.1 AREA STUDIED

2.2 Scope of Study

This Flood Insurance Study covers the geographic area of Canadian County, Oklahoma, including the incorporated communities listed in Section 1.1.

The limits of study for the streams studied by detailed methods in the City of Mustang are shown below:

Stream	Limits of Detailed Study
Mustang Creek Tributary 1	From Southwest 59th Street to State Highway 152
East Branch Mustang Creek	From confluence with Tributary 1 to Morgan Road

Tributary 1	
West Branch Mustang Creek Tributary 1	From Southwest 59th Street to approximately 1,840 feet Tributary 1 upstream
South Branch Mustang Creek Tributary 2	From Southwest 59th Street to State Highway 152

Mustang Creek Tributary 1 and East Branch Mustang Creek Tributary 1 were revised for their entire study lengths to reflect the effects of a channelization project and to incorporate updated hydrologic information and hydraulic analyses.

All or portions of Mustang Creek Tributary 2, South Branch Mustang Creek Tributary 2, East Branch Mustang Creek Tributary 1, and several unnamed streams in the City of Mustang were studied by approximate methods.

For the City of Piedmont, the USGS, FEMA, and City officials agreed that the following streams, which are tributaries to Deer Creek, would be studied in detail: Soldier Creek, Soldier Creek South Branch, and Deer Creek Tributaries 5 and 11. These stream reaches were chosen with primary consideration given to existing development and forecasted development through 1984. Stream reaches of Cottonwood Creek and the Wolf Creek Tributary within the study area have had the 100-year flood boundaries delineated by approximate methods (Reference 3). Deer Creek was studied in detail during the first restudy for Oklahoma County.

Detailed studies for the City of Yukon were made of floods caused by stream overflow from the North Canadian River, North Canadian River Tributary A, Main Stem Turtle Creek, and East, Middle, and West Branches Turtle Creek.

Data for the North Canadian River were developed during the Oklahoma City Metropolitan Area Flood Insurance Study. The portion of the work applicable to this study is presented here.

The areas studied by detailed methods were selected with priority given to all known flood hazards and areas of projected development or proposed construction.

Approximate analyses were used to study those areas having a low development potential or minimal flood hazards. The scope and methods of study were proposed to, and agreed upon, by FEMA and Canadian County.

This countywide update also incorporates the results of map-able Letters of Map Change, including Letters of Map Amendment and LOMRs issued by FEMA for the projects listed in Table 1, "Letters of Map Change".

Table 1 – Letters of Map Change

Community	Case Number	Flooding Source(s)	Effective Date	Status
City of Mustang	07-06-0183P	Mustang Creek Tributary 2 South Branch	02/20/2007	INCORPORATED
City of Oklahoma City	03-06-696P	Mustang Creek, Mustang Creek New Channel, Mustang Creek Tributary 1	02/26/2003	INCORPORATED
City of Oklahoma City	01-06-2001P	Mustang Creek, Mustang Creek New Channel, Mustang Creek Tributary 1	09/24/2002	SUPERSEDED

2.3 Community Description

The City of Mustang is located in the southeastern portion of Canadian County in central Oklahoma, approximately 15 miles southwest of downtown Oklahoma City. Its land area of 12 square miles is completely surrounded by Oklahoma City. The 1970 population was 2,637 (Reference 4). In 2000, the population reached 13,156 (Reference 5). Mustang is a rapidly growing community, with many of its residents commuting to jobs in the metropolitan area of Oklahoma City. The City's economy is based primarily on local businesses, but a limited amount of farming takes place in parts of Mustang.

The climate of the area is variable, with gradual seasonal changes. Temperatures range from 15°F in winter to 100°F in summer. Average daily maximum temperatures range from 48°F in January to 95°F in July and August, and average daily minimum temperatures range from 28°F in January to 70°F in July and August; the average yearly temperature is 62°F. In some years, as many as 15 consecutive days of temperatures above 100°F have been recorded in July and August. Winter temperatures below freezing occur on an average of 80 days per year; the temperature drops below 0°F on an average of only 1 day out of the year (Reference 6).

The average annual precipitation in Mustang is 32 inches, with accumulations varying throughout the year. Fall and winter are the driest seasons, receiving 10 to 20 percent of the total precipitation; an average of 6 inches of snow falls in January and February. A majority of rain, 33 percent, falls during spring, and the month of May receives 15 percent of the yearly total.

The topography in the City of Mustang is characterized by gently rolling plains. The soils are formed under a cover of grasses in material weathered in sandstone. The surface layer is reddish-brown loam about 11 inches thick, the upper 14 inches of subsoil consist of a reddish-brown loam, and the lower 8 inches of subsoil consist of a red loam. The underlying material is red sandstone to a depth of 40 inches. This soil is well drained with a moderate permeability. The water table is located at a depth of more than 6 feet at times of high water capacity. Slopes range from 3 percent on the uplands to 8 percent near the streams. Elevations range from 1,270 to 1,370 feet (Reference 7).

The stream channels are uniform for all reaches within the study boundaries. This is characterized by straight flowing channels with 5 to 12 feet from channel bottom to overbanks. Floodplains vary from smooth grassland to tree-lined banks with dense underbrush. The only stream with urban development is East Branch Mustang Creek Tributary 1, which is becoming heavily urbanized in the upper parts of its basin.

The City of Piedmont covers about 41 square miles of northeastern Canadian County and southeastern Kingfisher County adjacent to Oklahoma City, which lies to the south and east. The local climate is typically sub-humid with a mean annual temperature of about 61°F and an average annual precipitation of 30 inches. Precipitation varies seasonally with the wettest periods ordinarily occurring during late fall and winter. The highest streamflows normally result from intense thunderstorms associated with squall line activity that generally moves from west to east across the City. Elevations in the study area range from 1,073 to 1,340 feet National Geodetic Vertical Datum of 1929 (NGVD).

The 2000 population of the City of Piedmont was 3,650 (Reference 5). The City has recently experienced a rapid growth in population. The trend appears to be mainly the building of homes on small acreages. The present rate of growth is expected to continue during the foreseeable future. Continuing development within the study area will probably lead to intensified floodplain use. Development along some streams appears to have been initiated without due consideration for the flood risk incurred when building in the floodplain.

The City of Piedmont is located in the central red-bed plains region of central Oklahoma. The majority of the corporate area has brown to reddish-brown silt loam surface soils with reddish, blocky clay, slowly permeable subsoils. The western third of the study area is underlain by red-brown to orange-brown fine-grained sandstone with some mudstone conglomerate and shale. The central third of the study area is underlain by mostly red-brown shale. The eastern third of the study area is underlain by red-brown blocky shale and orange- brown siltstone. Typical land form in this area is a gently rolling prairie with local relief of 100 feet and relatively narrow floodplains along the streams.

The City of Piedmont lies within the drainage basins of Deer Creek in the south and Cottonwood Creek in the north. Storm runoff in south Piedmont flows in a generally southeastward direction out of the study area and in north Piedmont flows in a generally northward direction out of the study area.

Floodplain areas along the streams are typically open grass and farmlands except along the riparian areas where tree and brush concentrations vary from scattered to dense. Land use along the floodplains of the streams in the northern part of the study area is principally agricultural while land use along the floodplains of streams in the southern part of the study area is residential at their upper reaches and agricultural at the lower reaches. The residential areas of Piedmont are primarily located at the upper reaches of Soldier Creek, Soldier Creek South Branch, and Deer Creek Tributary 5, which are tributaries to Deer Creek. Presently, flood problems are generally confined to local drainage and a few undersized openings through road-fills. The probability of increased flooding problems in the future has been enhanced by the urbanization presently in progress.

The City of Yukon is located in central Oklahoma in eastern Canadian County along the west fringe of the Oklahoma City urban area, and adjacent to the North Canadian River.

The community had a 1960 population of 3,076, which reached a 1970 figure of 8,411. A special census in 1975 recorded a population of 12,980. The 1990 population reached 20,935 and the 2000 census indicated a population of 21,043 (Reference 5). As a result of this increase in population, the city experienced heavy residential development throughout the city in the areas south of the North Canadian River. Yukon is a residential and retail trade service center for the western part of the large Oklahoma City metropolitan urban area.

Yukon is located among gently rolling hills, bounded to the north by the Canadian River. Native vegetation consists of prairie grasses and scattered soft and hard wood deciduous trees.

The North Canadian River with its wide, prominent floodplain is the dominant feature of the study area and presents a formidable barrier to development to the north. For that reason, the upland strip of Yukon lying north of the river has remained in agricultural use. New development, mostly residential, is occurring in the southern part of the community.

The City of Yukon was founded in 1891 by landowners who were interested in taking advantage of the development potential of the Chicago Rock Island and Pacific Railroad (originally the Choctaw, Oklahoma, and Gulf Railroad). For many years the economy of Yukon was supported by the agricultural activities of the surrounding area and until about 1950, Yukon could have been classified as an agricultural retail trade and milling center.

Annexation of lands came as housing demands began to change in the 1950s. The corporate limits of Yukon now encompass an area of about 26 square miles. Yukon is located in rolling grasslands typical of the Great Plains.

The North Canadian River rises in New Mexico and flows southeasterly to its confluence with the South Canadian River about 110 miles east of the study area. The elongated watershed drains almost 18,000 square miles, of which 13,221 square miles are above Lake Overholser. Basin information and channel characteristics for the various flooding sources studied in detail are shown below:

Table 2 – North Canadian River Basin Characteristics

Flooding Source	Length of Stream Studied (miles)	Average Streambed Slope (feet per mile)	Contributing Drainage Area Above Lower Limit of Study (square miles)
North Canadian River	8.1	4.6	8301
North Canadian Tributary A	0.8	19	0.9
Main Stem Turtle Creek	2.7	11	4.2
East Branch Turtle Creek	0.9	20	1.2
Middle Branch Turtle Creek	1.3	25	1.1
West Branch Turtle Creek	0.5	41	0.52

The Canadian River has a contributing drainage area of 25,800 square miles above the

upper limits of the study area. Runoff of 20,000 square miles is regulated by Lake Meredith in the Texas Panhandle.

Lake Overholser is a municipal water-supply reservoir which lacks flood storage capability to modify flooding of the magnitude discussed in this study. The total drainage area above Lake Overholser is 13,221 square miles; the total drainage area above the lower end of the study area is 13,501 square miles.

Floodplain areas along the streams are typically open grass and farmland, except along the riparian areas where tree and brush concentrations vary from scattered to dense. Floodplains along smaller streams are narrow and generally densely wooded. Land use along the larger streams in the eastern and extreme northwestern parts of the study area is principally agricultural, while land use along the floodplains of the smaller streams in the central and western parts of the study area is commercial or residential. Prior to the rapid growth of the past two decades, the urban area of Oklahoma City was centered along the North Canadian River. Therefore, flood problems were generally confined to local drainage and river floodplains. The probability of increased flood problems in the future has been enhanced by the rapid and widespread urbanization in progress.

Most major streams in the study area flow generally east. The North Canadian River, which is a totally regulated watercourse, flows from west to east through the center of Oklahoma City. A short portion of the Canadian River and several tributaries drain the southwest and south-central portions of the city. Deep Fork drains the highly urbanized northern and northeastern portions of the study area. Deer Creek and Hog Creek drain the extreme northwest and southwest corners, respectively, which are mostly rural. The upper portions of the Bluff Creek Tributary to Deer Creek are highly urbanized.

Deer Creek originates in eastern Canadian County and flows generally in an east-northeasterly direction to its confluence with Cottonwood Creek in Logan County. The total drainage area of Deer Creek at its mouth is about 145 square miles. The drainage area above the study limits (this includes Soldier Creek, Dorf Creek, Biddy Creek, Walnut Creek and Tributary, and Bluff Creek) is about 139.2 square miles. The majority of the basin is undeveloped and used for agricultural purposes, but residential development is occurring in selected areas, primarily in the southern and eastern portions of the study area. Basin topography in the study area is mainly gently rolling hills with limited agricultural usage in the undeveloped areas. Above the lower limit of study, the watershed is about 16 miles long and averages about 8 miles wide.

The Deer Creek basin is located in the extreme northwestern portion of the study area, and the stream flows in a northeast direction. Most of the basin is rural, but one major tributary, Bluff Creek, drains some extensive urban areas involving several lakes. The remaining area of the basin has many National Resources Conservation Service (NRCS) lakes with significant flood control capability.

Deer Creek and Hog Creek drain the extreme northwest and southwest corners, respectively, which are mostly rural. The upper portions of the Bluff Creek Tributary to Deer Creek are highly urbanized.

2.4 Principal Flood Problems

The greatest potential flood hazards within the City of Mustang exist along Mustang

Creek Tributary 1 and its tributaries. The urban development occurring along these streams is one cause of these hazards. There are no historical flood data available for the study area.

The greatest potential for flood damage along the stream reaches studied in the City of Piedmont exists along the upper reaches of Soldier Creek and Soldier Creek South Branch north of Edmond Road and Deer Creek Tributary 5 west of Piedmont Road. Residential development along the floodplain and undersized bridge and culvert openings comprise the problem in these reaches. The potential for future flood problems can be reduced within the City of Piedmont by the exercise of proper floodplain management practices.

The lack of rainfall and peak-stage data precludes evaluation of past flood problems in the City of Piedmont.

River and flooding data have been recorded near the City of Yukon study area since 1914. The maximum flood of record on the North Canadian River occurred in October 1923. Rainfall data indicate that floods of similar magnitude occurred in 1877 and 1899. Other notable floods occurred in 1914, 1915, 1932, 1934, 1935, 1941, 1946, 1951, 1957, 1959, and 1974. The USACE has estimated the flows on the North Canadian River from the 1923 flood of record to be approximately 80,000 cubic feet per second (cfs) at Lake Overholser.

Peak discharge of the 1923 flood was calculated without upstream flood regulation. With Optima, Fort Supply, and Canton Lakes in place, a similar flood is calculated to have a peak discharge of approximately 34,000 cfs at Lake Overholser with a recurrence interval of approximately once in 50 to 60 years.

There are no streamflow records available for the Main Stem Turtle Creek watershed and North Canadian River Tributaries A, B and C. Newspaper accounts indicate that flooding occurred in 1915, 1923, 1934, 1935, 1941, 1942, 1944, 1946, 1951, 1957, 1959, 1974, 1983, 1986, 1993, 1995, and 1998. Long-time local residents say the flood of November 2, 1974, is the largest they can recall. Area precipitation measurements for this storm include almost 6 inches at Wiley Post Airport, 5 inches near Lake Hefner, and 4.8 inches at the Bluff Creek gage just south of Lake Overholser in approximately a 3-hour period. Reports of flood water depth over U.S. Highway 66 at Main and East Branch Turtle Creeks range from 2 to 4 feet. City of Yukon police and fire units evacuated a nursing home on Walnut Avenue between Middle and West Branches Turtle Creek near their confluence, as waist-deep flood waters surged through the structure. Several other structures in the watershed were damaged by the flood and families fled their homes as plans to evacuate the entire south side of the City of Yukon were being carried out. High water marks for the November 1974 flood near U.S. Highway 66 are shown on Flood Profile Panels 19P and 22P. Flooding on the smaller streams in the Yukon area is usually caused by intense rainfall resulting from local thunderstorms. The amount of flooding is generally increased in areas where natural and manmade obstructions in the floodplain impede large flows. Manmade obstructions include bridges, culverts, housing, commercial development, and earthfills. Factors that aggravate flood problems are residential and commercial development and undersized culverts at the abandoned interurban railroad embankment on Tributary B and C and an undersized railroad culvert on East Branch Turtle Creek. As the amount and density of urban development continue to increase, the amount of runoff can also be expected to increase, thus increasing the

flood heights and amount of damage.

The North Canadian River has its headwaters in New Mexico and flows in a southeasterly direction through western Oklahoma to Oklahoma City and then to Eufaula Reservoir in eastern Oklahoma. The reach of the river which flows through the Oklahoma County Flood Insurance Study area is controlled at the extreme end by the Canton Reservoir which is approximately 75 miles upstream and the rest is affected by Lake Overholser.

Discharge records in the North Canadian River basin are available for the gaging stations at Canton, El Reno, and Oklahoma City from 1938 to the present and are published in USGS water-supply papers. Some state records for these stations extend back to 1914. Prior to the establishment by the U.S. Weather Bureau of the river and flood service at Oklahoma City in 1914, available data for floods are exceptionally meager. A notable storm occurred in October 1908, and old settlers are in agreement that this was particularly severe east of Oklahoma City.

There have been a number of major floods on the North Canadian River this century. The worst floods occurred in October 1932, June 1932, June 1923, June 1915, and June 1914. The October 1923 flood was estimated at having a peak discharge of about 80,000 cubic feet per second (cfs). This estimate is based on a rainfall runoff analysis and discharge rating curves developed (References 8 and 9).

Local reports suggest that the 1932 flood may have caused more extensive flooding in downtown Oklahoma City than the 1923 flood because of its local intensity. The 1923 flood was more general in nature.

The two largest floods since July 1939, on the Canadian River occurred on May 4, 1941, and June 23, 1948. The flows near the study area for the floods were 200,000 cfs and 153,000 cfs, respectively. In recent years, no floods have approached the magnitude of these floods. There are reports of large floods in 1904 and 1914, but no discharges are available.

The Deer Creek basin is located in the northwest part of the county and flows in a northeasterly direction out of the county. Most of the basin is rural except for one major tributary, Bluff Creek. It drains an extensive urban area involving several urban lakes including Lake Hefner, a major water supply lake for Oklahoma City. The remaining area also has many NRCS lakes with significant flood control capability.

There is no record of damaging floods in the Deer Creek basin except for the upper Bluff Creek Watershed for a relatively short period of time. The greatest recorded flood on Bluff Creek occurred on November 2, 1974. Other significant floods occurred on June 16, 1955, June 4, 1973, September 3, 1973, and June 8, 1974.

2.5 Flood Protection Measures

The North Canadian River has three major flood control projects above the study area. Canton Lake, located at River Mile (RM) 394.3 in the northwestern corner of Blaine County; Fort Supply Lake at Stream Mile 5.5 of Wolf Creek, which flows into the main stem of the North Canadian River at approximately RM 488 in the northwestern corner of Woodward County; and Optima Lake at RM 623.2 in Texas County. A small City of

Yukon-owned recreation lake is located 0.5 mile upstream of Vandament Avenue on Middle Branch Turtle Creek. The lake does not provide significant flood control storage because of the small 0.4- square-mile drainage area above the dam and the design of the structure. The earthen dam failed during the 1974 flood, but has since been repaired.

There have been numerous channel modifications along the various branches of Turtle Creek by local interests. These channel works do not provide adequate protection against large floods.

Lake Overholser on the North Canadian River, 20 miles upstream from Midwest City, is a municipal water supply reservoir and has no provisions for flood control. This system of lakes would have reduced the October 1923 flood of 80,000 cfs to about 34,000 cfs.

The Oklahoma City "North Canadian River Floodway" project consists of an improved and straightened channel with spoil banks on both sides of the channel. The system extends approximately 13.5 miles through the Oklahoma City, Del City, and Midwest City areas. The project was designed to carry 45,000 cfs.

3.1 ENGINEERING METHODS

For the flooding sources studied by detailed methods in the community, standard hydrologic and hydraulic study methods were used to determine the flood-hazard data required for this study. Flood events of a magnitude that are expected to be equaled or exceeded once on the average during any 10-, 50-, 100-, or 500-year period (recurrence interval) have been selected as having special significance for floodplain management and for flood insurance rates. These events, commonly termed the 10-, 50-, 100-, and 500-year floods, have a 10-, 2-, 1-, and 0.2-percent-annual-chance, respectively, of being equaled or exceeded during any year. Although the recurrence interval represents the long-term, average period between floods of a specific magnitude, rare floods could occur at short intervals or even within the same year. The risk of experiencing a rare flood increases when periods greater than 1 year are considered. For example, the risk of having a flood that equals or exceeds the 100-year flood (1-percent chance of annual exceedence) in any 50-year period is approximately 40 percent (4 in 10); for any 90-year period, the risk increases to approximately 60 percent (6 in 10). The analyses reported herein reflect flooding potentials based on conditions existing in the community at the time of completion of this study. Maps and flood elevations will be amended periodically to reflect future changes.

3.2 Hydrologic Analyses

Hydrologic analyses were carried out to establish peak discharge-frequency relationships for each flooding source studied by detailed methods affecting the community.

The peak discharges for floods of the selected recurrence intervals were determined for the City of Mustang using equations established by Thomas and Corley (Reference 10). These equations were derived using standard statistical regression techniques and by relating the drainage area, slope, and mean annual precipitation as parameters for determining discharges.

Unit hydrographs were used for the City of Mustang when a ponding analysis problem would reduce the peak discharge significantly. On several streams, these ponding

analyses caused a decrease in the downstream discharge, which in turn resulted in a lower water- surface profile (Reference 11).

A regional relationship relating basin characteristics and rainfall to streamflow characteristics (Reference 10) was the principal method used to determine the 10-, 2-, 1-, and 0.2-percent discharges for the City of Piedmont study.

Gaging stations at Canton, El Reno, and Oklahoma City were the principal sources of data for defining discharge-frequency relationships for the North Canadian River. Discharge records from these stations are available from 1938, with some stage records dating from 1914. The analysis followed the standard log-Pearson Type III method, as outlined by the U.S. Water Resources Council (Reference 12), with adjustments made for expected probability as outlined in "Statistical Methods in Hydrology" (Reference 13). A straight line extrapolation was then used to determine the 500-year peak flow. For floodflows on the other streams studied in the City of Yukon, the drainage areas were appropriately subdivided and synthetic unit hydrographs determined for each subarea. Flood hydrographs were computed for the subareas using rainfall data from Technical Paper No. 40, "Rainfall Frequency Atlas of the United States" (Reference 14). The computed flows were then routed by the storage-discharge method and combined to

obtain peak flows at various points along the streams. The unit hydrographs were adjusted to reflect the effects of development presently existing in the watershed.

Flood discharges for the Canadian River were based on gaging station records at Newcastle and Bridgeport. The profile computations upstream of Cow Creek were run by the USGS.

Flood-flow frequencies for the North Canadian River were based on a statistical study of recorded and estimated flows at the Canton, El Reno, and Lake Overholser stream gages. Discharge-frequency information was developed for the Lake Overholser gage using standard hydrologic methods as outlined in USGS Bulletin 17 (Reference 12). An adjustment for expected probability, as outlined in Statistical Methods in Hydrology was used to retain consistency with previous analyses (Reference 13).

Lake Meredith was constructed by the Bureau of Reclamation in 1965 on the mainstem of the Canadian River in the Texas Panhandle. Based on the preceding information, and an estimate of the effective drainage areas involved, it was concluded that the effective peak annual discharge for the year 1941, had Lake Meredith been in place in that year, would have been about 135,000 cfs. This value was later used in the frequency analysis. The final adopted frequency curve uses the maximum annual peak flows recorded at the Bridgeport, Newcastle, Nobel, and Purcell stream gages for the period of record of 1939 through 1990, with the May 1941 Newcastle flow of 200,000 cfs adjusted downward to 135,000 cfs. The resulting discharge-frequency curve yields a 100-year frequency discharge of 162,000 cfs.

The 100-year peak discharges for Soldier Creek South Branch and Deer Creek Tributary 5A were developed using the USACE HEC-1 computer program (Reference 15). The ordinates of the hydrographs were computed by HEC-1 using the Snyder's unit-hydrograph method. The loss rates from a HEC-1 model for Cottonwood Creek were used in the HEC-1 models for Soldier Creek South Branch and Deer Creek Tributary 5A. The loss rates in the HEC-1 model for Cottonwood Creek, which was developed by the

USACE, Tulsa District, for an ongoing study, were calibrated using the results from a log-Pearson Type III analysis of the Seward stream gage (located on Cottonwood Creek near Guthrie, Oklahoma). Frequency curves for Deer Creek Tributary 5A and Soldier Creek South Branch were then drawn with the curve passing through the computed 100-year discharge and parallel to the curve for the Seward gage for the purpose of extrapolating the 500-year peak discharges.

For the 2002 City of Yukon study on North Canadian River Tributary A, North Canadian River Tributary B, North Canadian River Tributary C, Main Stem Turtle Creek, Turtle Creek East Branch with Cornwell Tributary, Middle Branch Turtle Creek with Holly Branch of Middle Branch Turtle Creek and Turtle Creek West Branch, the hydrologic analyses for the restudy were performed using the USGS regression formulas for Oklahoma streams presented in the USGS Water Resources Investigation Report 97-4202 (Reference 16).

Hydrologic computations for this revision and analyses for Lower Cimarron-Skeleton Watershed, Oklahoma consist of determining discharges for the 10-, 4-, 2-, 1-, and 0.2-percent-annual-chance flood events for a total of 18 miles of detailed study streams. These discharges will support the Physical Map Revision (PMR) of Canadian, Garfield, Kingfisher, Logan and Oklahoma counties in Oklahoma. The Hydrologic Unit Code (HUC8) for Lower Cimarron-Skeleton Watershed is 11050002.

In accordance with FEMA standards and guidance, Oklahoma regression analysis and U.S. Geological Survey (USGS) gage analyses were selected for estimating the peak discharges for this study, where applicable. Rainfall-runoff modeling was only used where determined to be necessary, as described in more detail in the following sections. The regression equations used for this study can be found in the USGS Scientific Investigation Report (SIR) 2010-5137, Methods for Estimating the Magnitude and Frequency of Peak Stream Flows for Unregulated Streams in Oklahoma (Reference 59).

Peak discharge-drainage area relationships for the sources studied by detailed methods are shown in Table 3.

Table 3 – Summary of Discharges

Flooding Source and Location	Drainage Area (square miles)	Peak Discharges (cubic feet per second) 10-Percent	2-Percent	1-Percent	0.2-percent
Cow Creek Tributary 2					
At the mouth	*	2,679	4,885	6,143	9,251
0.25 mile east of Rockwell Avenue	*	1,749	3,169	3,960	5,925
0.25 mile east of Council Road	*	1,546	2,817	3,520	5,266
At the County Line Road	*	1,363	2,505	3,131	4,688
0.5 miles west of County Line Road	*	845	1,559	1,940	2,890
Deer Creek					
At County Line Road	*	4,218	8,047	10,374	16,145
0.5 mile downstream of Mustang Road	*	3,222	6,335	8,239	12,983
At Czech Hall Road (Piedmont Road)	*	1,317	2,769	3,794	6,400
At North wood Lake Dam	*	2,574	4,844	6,118	9,334
0.5 mile upstream of Northwood Lake Dam	*	2,073	3,966	5,010	7,676
At Richland Road	*	961	1,767	2,100	3,280
Deer Creek Tributary 3					
0.5 mile downstream of Northwest 158th St.	4.33	435	782	980	2,050
At Pond 25-3 Dam	3.68	878	1,530	1,958	3,384
At Pond 24-5 Dam	2.89	579	1,044	1,287	1,899
At Pond 24-4 Dam	1.87	897	1,631	2,025	3,010
Deer Creek Tributary 3 West Branch					
0.25 mile downstream of County Line Road	0.94	583	1,057	1,304	1,928
Deer Creek Tributary 4					
0.25 mile downstream of Pond 24-8 Dam	2.84	218	389	473	690
At Pond 24-8 Dam	2.61	1,166	2,136	2,664	3,978
0.25 mile downstream of Northwest 122th St.	1.41	870	1,605	1,999	2,980
Deer Creek Tributary 5					
0.25 mile downstream of Mustang Road	2.95	1,111	2,010	2,498	3,717
0.25 mile downstream of Piedmont Road	1.11	677	1,235	1,529	2,267

* Data Not Available

Table 3 – Summary of Discharges (Continued)

Flooding Source and Location	Drainage Area (square miles)	Peak Discharges (cubic feet per second) 10-Percent	2-Percent	1-Percent	0.2-percent
Deer Creek Tributary 5					
Approximately 1,500 feet upstream of Washington Avenue NW	0.71	455	925	1,193	1,930
Approximately 30 feet downstream of Stout Drive NW	0.66	436	887	1,145	1,854
Approximately 2,150 feet upstream of Stout Drive NW	0.44	333	678	878	1,429
Approximately 4,500 feet upstream of Stout Drive NW	0.14	149	30	398	657
Deer Creek Tributary 5A					
At confluence with Deer Creek Tributary 5	0.72	*	*	1,160	2,250
At Piedmont Road	0.41	*	*	660	1,250
Deer Creek Tributary 6					
At Northwest 136th Street	1.61	831	1,513	1,878	1,250
Deer Creek Tributary 7					
At Northwest 136th Street	2.71	1,179	2,157	2,689	4,015
0.25 mile upstream of northwest Highway	1.29	799	1,429	1,775	2,639
At Ashford Drive	0.94	855	1,306	1,528	2,071
Deer Creek Tributary A to Tributary 7					
At mouth	0.14	241	363	420	561
Deer Creek Tributary B to Tributary 7					
At mouth	0.48	534	810	943	1,269
Deer Creek Tributary 8					
0.25 mile upstream of Czech Hall Road	4.20	1,420	2,677	3,415	5,263
0.5 mile upstream of Cemetery Road	1.48	587	1,186	1,572	2,513
Deer Creek Tributary 11					
0.25 mile downstream of Oak Hill Drive	1.58	850	1,553	1,929	2,869
Deer Creek Tributary 12					
At Frisco Road	2.69	1,143	2,085	2,596	3,872
0.25 mile downstream of Northwest 164th Street	1.28	775	1,421	1,765	2,624
Deer Creek Tributary 13					
At La Cresta Drive	1.23	347	629	839	1,520

* Data Not Available

Table 3 – Summary of Discharges (Continued)

Flooding Source and Location	Drainage Area (square miles)	Peak Discharges (cubic feet per second) 10-Percent	2-Percent	1-Percent	0.2-percent
Deer Creek Tributary 14					
At Pond 25-6 Dam	1,72	683	1,328	1,627	2,399
At Pond 25-8 Dam	1.54	842	1,540	1,913	2,845
Mustang Creek					
At County Line Road	30.80	4,360	8,640	10,820	16,465
At Sara Road	13.20	2,760	5,470	6,875	10,415
At Mustang Road	6.90	1,815	3,585	4,515	6,795
0.5 mile upstream of Cemetery Road	2.10	920	1,810	2,290	3,425
Mustang Creek Tributary 1					
At Southwest 29th Street	4.80	1,495	2,947	3,715	5,584
0.25 mile upstream of Southwest 59th Street	1.40	751	1,476	1,870	2,790
0.5 mile upstream of Southwest 59th Street	0.70	457	894	1,134	1,681
Mustang Creek Tributary 1 East Branch					
At confluence with Mustang Creek Tributary 1	0.56	46	916	1,167	1,734
Mustang Creek Tributary 1 West Branch					
At the mouth	1.20	492	1,107	1,341	1,946
Mustang Creek Tributary 2					
At Southwest 29th Street	10.20	2,110	4,145	5,195	7,825
At Mustang Road	4.80	1,460	2,880	3,625	5,445
At Czech Hall Road	2.40	955	1,875	2,365	3,595
Mustang Creek Tributary 2 South Branch					
At Southwest 59th Street	2.70	1,070	2,110	2,665	3,990
Mustang Creek Tributary 3					
At Southwest 15th Street	5.00	1,520	2,995	3,775	5,675
At Czech Hall Road	2.80	1,110	2,180	2,755	4,130
At West Reno Avenue	1.50	785	1,540	1,955	2,920

Table 3 – Summary of Discharges (Continued)

Flooding Source and Location	Drainage Area (square miles)	Peak Discharges (cubic feet per second) 10-Percent	2-Percent	1-Percent	0.2-percent
Mustang Creek Tributary 3 East Branch					
At the mouth	1.90	875	1,720	2,175	3,250
Mustang Creek Tributary 1					
At Southwest 29th Street	4.80	1,495	2,947	3,715	5,584
0.25 mile upstream of Southwest 59th Street	1.40	751	1,476	1,870	2,790
0.5 mile upstream of Southwest 59th Street	0.70	457	894	1,134	1,681
Mustang Creek Tributary 1 East Branch					
At confluence with Mustang Creek Tributary 1	0.56	465	916	1,167	1,734
Mustang Creek Tributary 1 West Branch					
At the mouth	1.20	492	1,107	1,341	1,946
Mustang Creek Tributary 2					
At Southwest 29th Street	10.20	2,110	4,145	5,195	7,825
At Mustang Road	4.80	1,460	2,880	3,625	5,445
At Czech Hall Road	2.40	955	1,875	2,365	3,595
Mustang Creek Tributary 2 South Branch					
At Southwest 59th Street	2.70	1,070	2,110	2,665	3,990
Mustang Creek Tributary 3					
At Southwest 15th Street	5.00	1,520	2,995	3,775	5,675
At Czech Hall Road	2.80	1,110	2,180	2,755	4,130
At West Reno Avenue	1.50	785	1,540	1,955	2,920
Mustang Creek Tributary 3 East Branch					
At the mouth	1.90	875	1,720	2,175	3,250
Mustang Creek Tributary 3 West Branch					
At the mouth	0.70	480	940	1,195	1,775

Table 3 – Summary of Discharges (Continued)

Flooding Source and Location	Drainage Area (square miles)	Peak Discharges (cubic feet per second) 10-Percent	2-Percent	1-Percent	0.2-percent
Mustang Creek Tributary 4					
At the mouth	1.80	895	1,765	2,240	3,350
At Cemetery Road	0.80	465	900	1,140	1,690
North Canadian River					
At lake Overholser	*	11,000	32,000	45,000	96,000
At U. S. Highway 66	*	10,500	30,500	44,500	95,500
City of Oklahoma City Corporate Limit	*	10,000	24,000	42,000	93,000
City of Oklahoma City/City of Yukon boundary	8.301	10,600	30,300	44,200	95,000
2.81 mile upstream of boundary	8,291	10,100	29,600	43,500	94,000
8.03 mile upstream of boundary	8,281	9,700	29,000	42,600	93,000
North Canadian River Tributary A					
At corporate boundary	1.23	1,000	1,700	2,100	3,100
0.69 mile upstream of corporate boundary	0.65	700	1,300	1,500	2,300
North Canadian River Tributary B					
0.28 mile upstream of confluence with North Canadian River	0.45	700	1,200	1,400	2,200
0.44 mile upstream of confluence with North Canadian River	0.40	700	1,100	1,400	2,100
0.48 mile upstream of confluence with North Canadian River	0.29	600	1,000	1,200	1,800
North Canadian River Tributary B West Branch					
At confluence with North Canadian River Tributary B	0.11	200	400	600	900
0.22 mile upstream of confluence with North Canadian River Tributary B	0.05	150	300	375	600
North Canadian River Tributary C					
0.32 mile upstream of confluence	0.87	900	1,700	2,000	3,100
0.58 mile upstream of confluence with North Canadian River	0.74	900	1,600	2,000	3,000
0.61 mile upstream of confluence with North Canadian River	0.45	700	1,200	1,500	2,300
1.14 mile upstream of confluence with North Canadian River	0.31	600	1,100	1,300	1,900

* = Data Not Available

* Data Not Available

Table 3 – Summary of Discharges (Continued)

Flooding Source and Location	Drainage Area (square miles)	Peak Discharges (cubic feet per second) 10-Percent	2-Percent	1-Percent	0.2-percent
North Canadian River Tributary C West Branch 1					
At confluence with North Canadian River Tributary C	0.29	350	750	950	1,600
0.56 mi. upstream of confluence with North Canadian River Tributary C	0.10	200	400	500	900
North Canadian River Tributary C West Branch 2					
At confluence	0.14	400	600	800	1,200
0.22 mi. upstream of confluence with North Canadian River Tributary C	0.10	200	450	600	900
Shell Creek					
At the mouth	22.70	3,121	5.546	6,945	10,415
0.5 mile South of Northwest 23th Street	15.90	2,717	4,865	6,092	9,138
At Northwest 10th Street	11.90	2,336	4,191	5,243	7,854
0.5 mile South of West Reno Avenue	6.80	1,664	2,982	3,714	5,541
At Southwest 15th Street	4.00	1,238	2,222	2,760	4,105
At Southwest 29th Street	1.80	819	1,479	1,831	2,714
Shell Creek Tributary 1					
At the mouth	0.90	518	929	1,143	1,683
Shell Creek Tributary 2					
At the mouth	1.10	644	1,169	1,445	2,139
Shell Creek Tributary 3					
At the mouth	2.50	961	1,730	2,144	3,181
0.333 mile East of Richland Road	1.60	785	1,422	1,761	2,610
At Frisco Road	0.70	482	872	1,074	1,583
Shell Creek Tributary 4					
At the mouth	3.30	1,053	1,881	2,329	3,454
0.5 mile South of Northwest 10th Street	2.00	813	1,457	1,800	2,664
0.333 mile West of Cimarron Road	1.00	614	1,115	1,377	2,038

Table 3 – Summary of Discharges (Continued)

Flooding Source and Location	Drainage Area (square miles)	Peak Discharges (cubic feet per second) 10-Percent	2-Percent	1-Percent	0.2-percent
Shell Creek Tributary 4 West Branch					
At the mouth	1.10	595	1,071	1,320	1,948
Shell Creek Tributary 5					
At the mouth	4.10	1,244	2,230	2,769	4,119
0.5 mile North of Southwest 15th Street	2.30	837	1,492	1,842	2,723
0.25 mile South of Southwest 15th Street	1.60	665	1,183	1,456	2,145
At Southwest 15th Street	1.10	554	990	1,217	1,791
Shell Creek Tributary 5 East Branch					
At the mouth	1.60	687	1,227	1,512	2,231
Shell Creek Tributary 6					
At the mouth	2.00	795	1,422	1,756	2,596
At Southwest 29th Street	1.40	661	1,184	1,460	2,156
Soldier Creek					
At Morgan Road	9.41	2,367	4,317	5,420	8,151
0.75 mile upstream of Morgan Road	7.15	2,092	3,830	4,807	7,225
0.5 mile downstream of Mustang Road	1.93	928	1,692	2,102	3,127
Approximately 1,750 feet upstream of Mustang Road	1.56	733	1,490	1,908	3,075
Soldier Creek North Branch					
Approximately 800 feet downstream of North County Line Road	2.81	1,061	2,153	2,739	4,394
Soldier Creek North Branch Tributary					
Approximately 800 feet downstream of NW 178th Street	1.37	709	1,440	1,844	2,960
Soldier Creek South Branch					
1,000 feet downstream Piedmont Road	1.44	*	*	2,180	4,100
500 feet downstream of Piedmont Road	1.09	*	*	1,650	3,300
At Piedmont Road	0.90	*	*	1,450	2,900

* Data Not Available

Table 3 – Summary of Discharges (Continued)

Flooding Source and Location	Drainage Area (square miles)	10-Percent	2-Percent	1-Percent	0.2-percent
Spring Creek of Deer Creek					
At Northwest 136th Street	4.57	1,593	2,912	3,643	5,457
0.5 mile downstream of Czech Hall Road	2.28	1,030	1,879	2,337	3,481
Turtle Creek Main Stem					
At downstream limit of study	3.41	2,800	4,300	5,000	7,000
0.47 mile upstream of downstream limit of study	3.07	2,700	4,100	4,800	6,600
0.52 mile upstream of downstream limit of study	1.89	1,900	2,900	3,500	4,800
1.16 mile upstream of downstream limit of study	1.63	1,800	2,800	3,200	4,600
Turtle Creek East Branch					
At confluence with West Branch	1.18	1,700	2,600	2,900	4,000
0.42 mile upstream of confluence	1.00	1,700	2,400	2,800	3,800
0.45 mile upstream of confluence	0.71	1,300	1,900	2,200	3,000
0.91 mile upstream of confluence	0.40	1,000	1,400	1,600	2,200
1.38 mile upstream of confluence	0.15	600	800	900	1,200
Turtle Creek Cornwell Branch of Each Branch					
At confluence	0.29	900	1,300	1,400	1,900
Turtle Creek Middle Branch					
At confluence	1.16	1,300	2,100	2,500	3,600
0.81 mile upstream of confluence	0.86	1,000	1,700	2,000	3,000
Turtle Creek Holly Branch of Middle Branch					
At confluence	0.25	600	1,000	1,200	1,700

3.3 Hydraulic Analyses

Analyses of the hydraulic characteristics of flooding from the sources studied were carried out to provide estimates of the elevations of floods of the selected recurrence intervals. Users should be aware that flood elevations shown on the Flood Insurance Rate Map (FIRM) represent rounded whole-foot elevations and may not exactly reflect the elevations shown on the Flood Profiles or in the Floodway Data tables in the Flood Insurance Study (FIS) report. Flood elevations shown on the FIRM are primarily intended for flood insurance rating purposes. For construction and/or floodplain management purposes, users are cautioned to use the flood elevation data presented in this FIS in conjunction with the data shown on the FIRM.

Cross-section data were obtained by aerial photogrammetric methods and located at close intervals above and below highway and railroad fills, bridges, and culverts to compute the significant backwater effects of these structures. All bridges and culverts in the City of Yukon were field surveyed to obtain elevation data and structural geometry. Field levels were run to spot check the vertical control in the City of Piedmont.

Channel roughness factors (Manning's "n" values) used in the hydraulic computations were assigned on the basis of field inspections of the stream and floodplain areas. For the streams studied by detailed methods in the City of Mustang, channel "n" values ranged from 0.010 to 0.050 and overbank "n" values ranged from 0.030 to 0.050. For the City of Piedmont, roughness values for the main channels and overbank areas ranged from 0.015 to 0.075. For the City of Yukon, roughness coefficients ranged from 0.02 for concrete channels to 0.06 for natural conditions for the main channel, and 0.04 to 0.08 for the overbank areas; however, some values reached 0.20 in heavily developed areas with houses, fences, and shrubs.

Water-surface elevations of floods of the selected recurrence intervals for Oklahoma City were determined using the USGS step-backwater computer program developed by Shearman (References 17 and 18). Starting elevations for the 10-, 2-, 1-, and 0.2-percent-annual-chance floods on Soldier Creek, Deer Creek Tributary 5, and Mustang Creek were determined by the slope-conveyance method. These elevations were verified by computing convergence profiles. Starting elevations for all of the tributaries were obtained from the step-backwater computation by starting in the larger stream at a cross section common to both streams with flood elevations and discharges previously determined for the main stream. Discharges were reduced to those computed for the first cross section in the tributary. This procedure computes elevations for the tributary cross sections that are hydraulically connected to the main stream.

Starting water-surface elevations for Oklahoma City at the lower end of Main Stem Turtle Creek and North Canadian River Tributary A were developed by the slope-area method. Starting water-surface elevations for the tributaries to Turtle Creek were based on profiles obtained from peak discharges along the Main Stem. Starting elevations for the North Canadian River profiles were established from previous studies on that stream downstream of the study area.

Water-surface elevations for Oklahoma City for the revised portions of Mustang Creek Tributary 1 and East Branch Mustang Creek Tributary 1 were computed using the USACE HEC-2 computer program (Reference 19).

Profile stationing for the City of Piedmont was obtained using the apparent centroid of flow along an inundated floodplain. A line was drawn along the center of the low-water channel in the relatively straight reaches that are roughly parallel to the floodplain boundaries and across S-bends and switchbacks. Profile distances were measured along these lines. They are shown as profile base lines on the maps.

Flood elevations on the stream reaches within the City of Piedmont study area that have had the 100-year flood depth delineated by approximate methods were determined by a regional relationship relating basin characteristics and rainfall to 100-year flood depth (Reference 11). The analysis of these stream reaches was more comprehensive than the previously published flood-prone area maps (Reference 3).

Within the City of Oklahoma City, cross-section data for the backwater analyses were obtained from aerial photography utilizing a stereo plotter to determine point elevations for selected locations. All bridges, dams, and culverts were field surveyed to obtain elevation data and structural geometry.

Water-surface elevations for floods of the selected recurrence intervals were originally computed using the USGS step-backwater computer program (Reference 18). The USACE HEC-2 computer program was used to compute the water-surface profiles for all or portions of Mustang Creek Tributary 3 East Branch (Reference 20). For the revised portions of Mustang Creek Tributary 1, the USACE HEC-2 computer program was used to compute water-surface elevations. Flood profiles were drawn showing computed water-surface elevations for floods of the selected recurrence intervals.

Starting water-surface elevations for "A" and "B" Creeks, tributaries to the North Canadian River, were taken at their confluence with the North Canadian River.

Water-surface elevations for Soldier Creek South Branch and Deer Creek Tributary 5A were computed through the use of the USACE HEC-2 computer program (Reference 20). The downstream starting water-surface elevations are based on the slope-area method. Cross sections were developed using topographic mapping at a scale of 1:4,800, with a 2-foot contour interval, dated March 1995 (Reference 21). Bridge geometry was field measured. Channel roughness factors (Manning's "n" values) for the hydraulic computations were assigned on the basis of field inspection and engineering judgment of the floodplain areas. Roughness values used were 0.035 for the channel and 0.040 for the overbank.

For the 2002 City of Yukon study on North Canadian River Tributary A, North Canadian River Tributary B, North Canadian River Tributary C, Main Stem Turtle Creek, Turtle Creek East Branch with Cornwell Tributary, Middle Branch Turtle Creek with Holly Branch of Middle Branch Turtle Creek and Turtle Creek West Branch, the majority of the cross sections used for the restudy were automatically generated by using INROADS from the three-dimensional topographic maps specifically prepared for this restudy. These topographic maps were compiled from aerial photography at a scale of 1" = 500' with a contour interval of 2 feet.

The cross sections for the North Canadian River Tributaries A, B and C, that portion downstream of the downstream study limit, were partly derived from the above-mentioned topographic maps and extended horizontally by using USGS 7.5-minute quadrangle maps (Reference 22). These areas are located within the North Canadian

River floodplain, generally north of the Union Pacific Railroad (Tributary B and C), and north of Bledshoe Park (on Tributary A).

These cross sections were supplemented with field surveyed cross sections of the bank to bank portion of the stream at selected locations.

Roughness coefficients (Manning's "n" values) were assigned based on observations made during field reconnaissance and professional engineering judgment. Table 4 identifies the known Mannings “n” values used for streams in Canadian County.

Water-surface elevations were developed by using the USACE's HEC-RAS computer program (Version 2.2.1) (Reference 23). Water-surface profiles were plotted using FEMA's RASPLOT (Reference 24).

The starting water-surface elevations for Tributaries A, B and C were taken from the coincident water-surface elevation at the start of the study of the North Canadian River floodplain edge taken from the Flood Insurance Study for Canadian County, Oklahoma, and Incorporated Areas (Reference 25). Starting water-surface elevations for the tributaries to Turtle Creek (and sub-tributaries) were based on profiles obtained from peak discharges along the Main Stem.

For the revision, hydraulic analyses were completed for Deer Creek Tributary 5, Soldier Creek, Soldier Creek North Branch and Soldier Creek North Branch Tributary as identified in the Technical Proposal for Task Order HSFE06-12-J-0001 under FEMA IDIQ Contract HSFEHQ-09-D-0369 for Lower Cimarron Skeleton Watershed, Oklahama. Hydraulic computations and analyses consist of determining water surface elevations (WSELs) for the 10-, 4-, 2-, 1-, and 0.2-percent-annual-chance flood events for a total of about 23.8 miles of detailed study streams. The hydraulic methods used for this analysis included steady flow analysis using HEC-RAS Version 4.1.0. and HEC-GeoRAS ARCGIS extension version 10.0. For the detailed study streams, each cross section was analyzed to ensure that the correct n value was assigned to each area of the cross section. This was done based on the USGS landuse data, topographic data, aerial imagery, field survey data, and field reconnaissance data (Reference 60). For all the studied streams, channel “n” values ranged from 0.030 to 0.050, and the overbank “n” values ranged from 0.04 to 0.12.

Locations of selected cross sections used in the hydraulic analyses are shown on the Flood Profiles (Exhibit 1). For stream segments for which a floodway was computed (Section 4.2), selected cross-section locations are also shown on the Flood Insurance Rate Map (Exhibit 2).

The hydraulic analyses for this study were based on unobstructed flow. The flood elevations shown on the profiles are thus considered valid only if hydraulic structures remain unobstructed, operate properly, and do not fail.

3.4 Vertical Datum

All FIS reports and FIRMs are referenced to a specific vertical datum. The vertical datum provides a starting point against which flood, ground, and structure elevations can be referenced and compared. Until recently, the standard vertical datum used for FIS reports and FIRMs was the National Geodetic Vertical Datum of 1929 (NGVD). With the

completion of the North American Vertical Datum of 1988 (NAVD), many FIS reports and FIRMs are now prepared using NAVD as the referenced vertical datum.

Flood elevations shown in this FIS report and on the FIRM are referenced to the NAVD. These flood elevations must be compared to structure and ground elevations referenced to the same vertical datum. Some of the data used in this revision were taken from the prior effective FIS reports and FIRMs and adjusted to NAVD88. The datum conversion factor from NGVD29 to NAVD88 in Canadian County is 0.547 feet.

For information regarding conversion between the NGVD and NAVD, visit the National Geodetic Survey website at www.ngs.noaa.gov, or contact the National Geodetic Survey at the following address:

Vertical Network Branch, N/CG13
National Geodetic Survey, NOAA
Silver Spring Metro Center 3
1315 East-West Highway
Silver Spring, Maryland 20910
(301) 713-3191

Temporary vertical monuments are often established during the preparation of a flood hazard analysis for the purpose of establishing local vertical control. Although these monuments are not shown on the FIRM, they may be found in the Technical Support Data Notebook associated with the FIS report and FIRM for this community. Interested individuals may contact FEMA to access these data.

To obtain current elevation, description, and/or location information for benchmarks shown on this map, please contact the Information Services Branch of the NGS at (301) 713-3242, or visit their website at www.ngs.noaa.gov.

Table 4 – Mannings "n" Values

	Roughness Coefficients	
Flooding Source	Channel	Overbanks
Cow Creek Tributary	0.015-0.060	0.030-0.100
Deer Creek		
Deer Creek Tributary 3	0.15-0.060	0.030-0.100
Deer Creek Tributary 3 West Branch	0.15-0.060	0.030-0.100
Deer Creek Tributary 4	0.15-0.060	0.030-0.100
Deer Creek Tributary 5	0.04	0.04-0.092
Deer Creek Tributary 6	0.15-0.060	0.030-0.100
Deer Creek Tributary 7	0.15-0.060	0.030-0.100
Deer Creek Tributary 8	0.15-0.060	0.030-0.100
Deer Creek Tributary 11	0.15-0.060	0.030-0.100
Deer Creek Tributary 12	0.15-0.090	0.030-0.100
Deer Creek Tributary 13	0.15-0.060	0.030-0.100
Deer Creek Tributary 14	0.15-0.060	0.030-0.100
Mustang Creek		
Mustang Creek New Channel	0.015-0.060	0.030-0.100

Mustang Creek Tributary 1	0.015-0.060	0.030-0.100
Mustang Creek Tributary 1 West Branch	0.015-0.060	0.030-0.100
Mustang Creek Tributary 2	0.015-0.060	0.030-0.100
Mustang Creek Tributary 2 South Branch	0.015-0.060	0.030-0.100
Mustang Creek Tributary 3	0.015-0.060	0.030-0.100
Mustang Creek Tributary 3 East Branch	0.015-0.060	0.030-0.100
Mustang Creek Tributary 3 West Branch	0.015-0.060	0.030-0.100
Mustang Creek Tributary 4	0.015-0.060	0.030-0.100
North Canadian River		
North Canadian River Tributary A	0.012 - 0.045	0.035 - 0.060
North Canadian River Tributary B	0.035 - 0.100	0.045 - 0.150
North Canadian River Tributary C	0.035 - 0.065	0.045 - 0.100
Shell Creek		
Shell Creek Tributary 1	0.015-0.060	0.030-0.100
Shell Creek Tributary 2	0.015-0.060	0.030-0.100
Shell Creek Tributary 3	0.015-0.060	0.030-0.100
Shell Creek Tributary 4	0.015-0.060	0.030-0.100
Shell Creek Tributary 4 West Branch	0.015-0.060	0.030-0.100
Shell Creek Tributary 5	0.015-0.060	0.030-0.100
Shell Creek Tributary 5 East Branch	0.015-0.060	0.030-0.100
Shell Creek Tributary 6	0.015-0.060	0.030-0.100
Soldier Creek	0.03-0.04	0.04-0.08
Soldier Creek North Branch	0.035-0.045	0.05-0.12
Soldier Creek North Branch Trib	0.04-0.045	0.05-0.12
Spring Creek of Deer Creek	0.015-0.060	0.030-0.100
Turtle Creek Main Stem	0.030 - 0.050	0.030 - 0.100
Turtle Creek East Branch	0.012 - 0.045	0.030 - 0.100
Turtle Creek Middle Branch	0.012 - 0.060	0.030 - 0.100
Turtle Creek West Branch	0.015 - 0.040	0.030 - 0.100

4.1 FLOODPLAIN MANAGEMENT APPLICATIONS

The NFIP encourages State and local governments to adopt sound floodplain management programs. To assist in this endeavor, each FIS report provides 1-percent-annual-chance floodplain data, which may include a combination of the following: 10-, 2-, 1-, and 0.2-percent-annual-chance flood elevations; delineations of the 1- and 0.2-percent-annual-chance floodplains; and a 1-percent-annual-chance floodway. This information is presented on the FIRM and in many components of the FIS report, including Flood Profiles, Floodway Data tables, and Summary of Stillwater Elevation tables. Users should reference the data presented in the FIS report as well as additional information that may be available at the local community map repository before making flood elevation and/or floodplain boundary determinations.

4.2 Floodplain Boundaries

To provide a national standard without regional discrimination, the 1-percent-annual-chance flood has been adopted by FEMA as the base flood for floodplain management purposes. The 0.2-percent-annual-chance flood is employed to indicate additional areas of flood risk in the community. For all streams studied by detailed methods, the 1- and

0.2-percent-annual-chance floodplain boundaries have been delineated using the flood elevations determined at each cross section. The boundaries were interpolated using City of Mustang topographic maps at a scale of 1:24,000, with a contour interval of 20 feet (Reference 7); topographic maps of the City of Mustang derived from aerial photographs and site development plans (References 7, 26, and 27); a topographic map of the City of Piedmont enlarged to a scale of 1:9,600, with a contour interval of 10 feet (Reference 2); topographic maps of the City of Piedmont at a scale of 1:4,800, with a contour interval of 2 feet (Reference 21); and topographic maps of the City of Yukon at scales of 1:4,800 and 1:24,000, with contour intervals of 10 feet supplemented with 5- and 2-foot contours.

The 1- and 0.2-percent-annual-chance floodplain boundaries are shown on the FIRM (Exhibit 2). On this map, the 1-percent-annual-chance floodplain boundary corresponds to the boundary of the areas of special flood hazards (Zones A and AE), and the 0.2-percent-annual-chance floodplain boundary corresponds to the boundary of areas of moderate flood hazards. In cases where the 1- and 0.2-percent-annual-chance floodplain boundaries are close together, only the 1-percent-annual-chance floodplain boundary has been shown. Small areas within the floodplain boundaries may lie above the flood elevations, but cannot be shown due to limitations of the map scale and/or lack of detailed topographic data.

For the City of Oklahoma City, floodplain boundaries were interpolated using topographic maps at a scale of 1:24,000 enlarged to a scale of 1:9,600 with a contour interval of 10 feet (Reference 28). The revised floodplain boundaries for Mustang Creek Tributary 1 were interpolated using topographic maps at a scale of 1"=200' with a contour interval of 5 feet (Reference 29). In the second revision for Chisholm Creek, revised floodplain boundaries were delineated using topographic mapping at a scale of 1:1,200 with contour interval of 2 feet (Reference 30). For the revised portion of Deep Fork Tributary 17, computer-generated mapping at a scale of 1:1,200 was used to delineate revised floodplain boundaries. Revised floodplain delineations along the West Branch of Harrison Creek Tributary 2 were plotted using topographic maps at a scale of 1:400 with a contour interval of 5 feet (Reference 31). For all areas not described above, 10 meter digital elevation models (DEMs) were used.

For the 2008 restudy, the boundaries for the streams in Mustang, Oklahoma City, and Yukon were redelineated based on the 2005 Oklahoma City LiDAR (Reference 32).

For the streams studied by approximate methods, only the 1-percent-annual-chance floodplain boundary is shown on the FIRM.

4.3 Floodways

Encroachment on floodplains, such as structures and fill, reduces flood-carrying capacity, increases flood heights and velocities, and increases flood hazards in areas beyond the encroachment itself. One aspect of floodplain management involves balancing the economic gain from floodplain development against the resulting increase in flood hazard. For purposes of the NFIP, a floodway is used as a tool to assist local communities in this aspect of floodplain management. Under this concept, the area of the 1 percent annual chance floodplain is divided into a floodway and a floodway fringe. The floodway is the channel of a stream, plus any adjacent floodplain areas, that must be kept free of encroachment so that the base flood can be carried without substantial increases in flood heights. Minimum Federal standards limit such increases to 1 foot, provided that hazardous velocities are not

produced. The floodways in this study are presented to local agencies as minimum standards that can be adopted directly or that can be used as a basis for additional floodway studies.

The floodways presented in this study were computed for certain stream segments on the basis of equal-conveyance reduction from each side of the floodplain. Floodway widths were computed at cross sections. Between cross sections, the floodway boundaries were interpolated. The results of the floodway computations are tabulated for selected cross sections (see Table 5, Floodway Data). In cases where the floodway and 1-percent-annual-chance floodplain boundaries are either close together or collinear, only the floodway boundary is shown.

The area between the floodway and 1-percent-annual-chance floodplain boundaries is termed the floodway fringe. The floodway fringe encompasses the portion of the floodplain that could be completely obstructed without increasing the water-surface elevation (WSEL) of the base flood more than 1 foot at any point. Typical relationships between the floodway and the floodway fringe and their significance to floodplain development are shown in Figure 1.

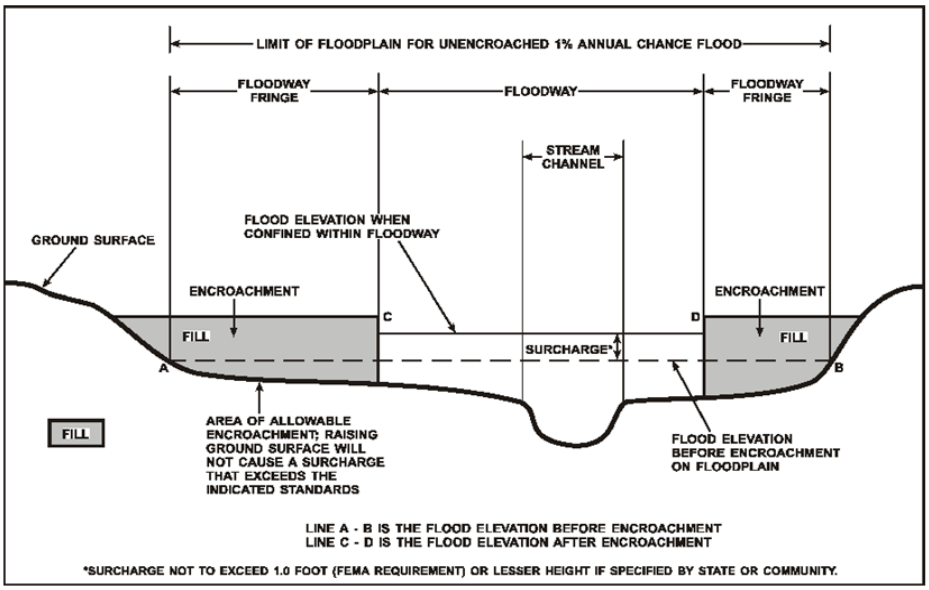

Figure 1 – Floodway Schematic

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
Cornwall Branch of East Branch of Turtle Creek								
A	200	30	211	4.70	1,288.5	1,288.5	1,289.3	0.8
B	540	200	1,543	0.70	1,294.7	1,294.7	1,295.0	0.3
C	715	221	106	0.90	1,294.7	1,294.7	1,295.0	0.3
D	900	175	562	1.40	1,294.7	1,294.7	1,295.0	0.3
E	1,330	116	131	6.10	1,296.3	1,296.3	1,296.3	0.0
F	1,840	78	115	6.90	1,298.9	1,298.9	1,298.9	0.0
G	2,300	73	113	7.10	1,304.5	1,304.5	1,304.5	0.0
H	3,140	79	116	6.90	1,319.5	1,319.5	1,319.5	0.0

[1]Feet above confluence with East Branch Turtle Creek.

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
Cow Creek Tributary 2								
A	2,200	370	1,063	5.80	1,196.5	1,194.1	1,194.9	0.8
B	2,490	300	691	8.90	1,196.9	1,196.0	1,196.7	0.7
C	5,590	200	1,159	3.40	1,207.8	1,207.8	1,208.3	0.5
D	7,500	200	702	5.60	1,211.5	1,211.5	1,211.6	0.1
E	9,900	210	876	4.50	1,219.0	1,219.0	1,219.1	0.1
F	13,460	200	566	6.20	1,232.3	1,232.3	1,233.2	0.9
G	14,300	140	802	4.40	1,236.2	1,236.2	1,237.1	0.9
H	14,490	115	899	3.90	1,237.8	1,237.8	1,237.8	0.0
I	16,880	54	421	8.40	1,243.8	1,243.8	1,244.8	1.0
J	18,530	79	708	5.00	1,254.1	1,254.1	1,254.3	0.2
K	20,010	80	678	4.60	1,258.8	1,258.8	1,259.3	0.5
L	20,260	65	639	4.90	1,259.4	1,259.4	1,259.9	0.5
M	22,160	49	310	10.10	1,264.7	1,264.7	1,264.9	0.2
N	23,480	32	323	9.7	1,272.2	1,272.2	1,272.4	0.2
O	23,770	60	740	4.2	1,278.8	1,278.8	1,278.8	0.0
P	25,280	99	818	2.4	1,279.9	1,279.9	1,280.8	0.9

[1]Feet above confluence with Deer Creek.

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

CANADIAN COUNTY, OK

AND INCORPORATED AREAS

FLOODWAY DATA

COW CREEK TRIBUTARY 2

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
Deer Creek								
AU[2]	72,970	1,723	4,031	2.6	1,074.6	1,074.6	1,075.6	1.0
AV	73,210	1,750	3,903	2.7	1,075.0	1,075.0	1,075.8	0.8
AW	75,320	1,115	1,708	6.1	1,080.0	1,080.0	1,080.4	0.4
AX	78,140	954	3,146	3.3	1,086.3	1,086.3	1,087.2	0.9
AY	79,310	1,015	2,448	4.2	1,087.6	1,087.6	1,088.5	0.9
AZ	79,650	1,077	2,278	4.6	1,088.0	1,088.0	1,088.9	0.9
BA	82,800	751	2,765	3.8	1,092.7	1,092.7	1,093.0	0.3
BB	85,860	200	1,684	6.2	1,096.7	1,096.7	1,097.2	0.5
BC	86,500	150	1,436	7.2	1,098.0	1,098.0	1,098.5	0.5
BD	86,830	150	1,520	6.8	1,099.0	1,099.0	1,099.4	0.4
BE	88,200	450	2,468	4.2	1,101.6	1,101.6	1,101.9	0.3
BF	90,300	650	2,044	5.1	1,104.8	1,104.8	1,104.9	0.1
BG	91,750	150	1,140	7.2	1,108.0	1,108.0	1,108.1	0.1
BH	94,160	333	2,584	3.2	1,112.1	1,112.1	1,112.3	0.2
BI	94,360	618	1,787	4.6	1,112.3	1,112.3	1,112.5	0.2
BJ	96,550	149	1,025	8.0	1,117.7	1,117.7	1,117.7	0.0
BK	98,640	150	1,345	6.1	1,124.4	1,124.4	1,124.6	0.2
BL	100,440	139	1,150	3.3	1,127.5	1,127.5	1,127.8	0.3
BM	100,600	80	774	4.9	1,127.7	1,127.7	1,128.0	0.3
BN	101,300	225	911	4.2	1,129.1	1,129.1	1,129.6	0.5
BO	104,380	255	1,039	3.7	1,135.3	1,135.3	1,136.3	1.0
BP	106,910	172	567	6.7	1,146.4	1,146.4	1,146.4	0.0
BQ	107,790	1,537	4,561	1.3	1,164.0	1,164.0	1,164.0	0.0
BR	110,450	245	631	7.9	1,164.4	1,164.4	1,164.4	0.0

[1]Feet above Oklahoma County\Logan County boundary
[2] Located outside of Canadian County boundary

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

CANADIAN COUNTY, OK

AND INCORPORATED AREAS

FLOODWAY DATA

DEER CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
Deer Creek (Cont'd)								
BS	112,860	120	670	7.5	1,167.3	1,167.3	1,167.3	0.0
BT	115,380	140	913	5.5	1,172.1	1,172.1	1,172.3	0.2
BU	115,530	170	841	6.0	1,177.4	1,177.4	1,177.8	0.4
BV	116,500	120	800	6.3	1,182.7	1,182.7	1,182.7	0.0
BW	116,640	150	1,080	4.6	1,185.5	1,185.5	1,185.5	0.0
BX	117,680	148	818	6.1	1,187.8	1,187.8	1,188.2	0.4
BY	118,490	120	876	5.7	1,191.7	1,191.7	1,191.7	0.0
BZ	118,550	120	513	9.8	1,191.8	1,191.8	1,191.8	0.0
CA	120,680	100	1,102	4.6	1,204.8	1,204.8	1,205.4	0.6
CB	122,540	96	558	9.0	1,211.7	1,211.7	1,212.5	0.8
CC	123,350	100	658	3.3	1,217.3	1,217.3	1,217.8	0.5
CD	123,420	100	756	2.9	1,219.2	1,219.2	1,219.2	0.0

[1]Feet above Oklahoma County\Logan County boundary

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
Deer Creek Tributary 11								
A	1,335	123	317	6.1	1,164.6	1,164.6	1,164.6	0.0
B	3,188	85	427	4.5	1,178.3	1,178.3	1,178.3	0.0
C	3,305	100	826	2.3	1,179.8	1,179.8	1,179.8	0.0
D	4,665	100	287	6.7	1,181.7	1,181.7	1,181.9	0.2
E	5,755	100	496	3.9	1,189.2	1,189.2	1,189.6	0.4
F	7,400	120	366	5.3	1,199.1	1,199.1	1,199.9	0.8
G	7,530	180	1,049	1.9	1,205.7	1,205.7	1,205.7	0.0
H	7,980	577	300	6.4	1,216.7	1,216.7	1,216.7	0.0
I	8,190	452	1,500	1.7	1,217.4	1,217.4	1,217.4	0.0

[1]Feet above confluence with Deer Creek.

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
Deer Creek Tributary 12								
A	1,190	57	339	7.7	1,170.3	1,170.3	1,171.1	0.8
B	1,310	76	502	5.2	1,171.8	1,171.8	1,172.6	0.8
C	2,935	40	293	8.9	1,182.8	1,182.8	1,182.8	0.0

[1]Feet above confluence with Deer Creek

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

CANADIAN COUNTY, OK

AND INCORPORATED AREAS

FLOODWAY DATA

DEER CREEK TRIBUTARY 12

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
Deer Creek Tributary 13								
A	480	58	125	6.7	1,172.4	1,172.4	1,172.5	0.1
B	520	58	164	5.1	1,173.3	1,173.3	1,173.3	0.0
C	1,340	61	176	4.8	1,180.1	1,180.1	1,180.2	0.1
D	1,410	25	82	10.2	1,184.0	1,184.0	1,184.0	0.0
E	1,590	621	164	5.1	1,197.7	1,197.7	1,197.7	0.0
F	2,710	158	428	2.0	1,202.1	1,202.1	1,202.7	0.6
G	4,660	48	101	8.3	1,217.8	1,217.8	1,218.2	0.4
H	4,885	50	220	3.8	1,220.9	1,220.9	1,220.9	0.0
I	5,720	50	117	7.2	1,224.6	1,224.6	1,225.4	0.8
J	5,865	281	929	0.9	1,229.4	1,229.4	1,229.4	0.0
K	6,490	168	175	4.8	1,231.1	1,231.1	1,231.1	0.0
L	6,535	144	146	5.7	1,245.8	1,245.8	1,245.8	0.0

[1]Feet above mouth

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

CANADIAN COUNTY, OK

AND INCORPORATED AREAS

FLOODWAY DATA

DEER CREEK TRIBUTARY 13

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
Deer Creek Tributary 14								
A	1,060	311	1,150	1.4	1,211.9	1,211.9	1,211.9	0.0
B	3,160	78	189	8.6	1,218.4	1,218.4	1,219.1	0.7
C	3,290	169	1,185	1.4	1,225.8	1,225.8	1,225.8	0.0
D	3,510	80	204	8.0	1,225.8	1,225.8	1,225.8	0.0
E	3,855	302	262	6.2	1,228.2	1,228.2	1,228.2	0.0
F	5,390	244	621	3.1	1,233.9	1,233.9	1,233.9	0.0
G	6,495	90	271	7.1	1,235.7	1,235.7	1,235.7	0.0
H	7,515	60	362	5.3	1,242.5	1,242.5	1,242.8	0.3
I	8,900	53	271	7.1	1,249.1	1,249.1	1,249.8	0.7

[1]Feet above confluence with Deer Creek.

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

CANADIAN COUNTY, OK

AND INCORPORATED AREAS

FLOODWAY DATA

DEER CREEK TRIBUTARY 14

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
Deer Creek Tributary 3								
O	20,970	85	231	8.8	1,182.5	1,182.5	1,182.6	0.1

[1]Feet above confluence with Deer Creek.

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

CANADIAN COUNTY, OK

AND INCORPORATED AREAS

FLOODWAY DATA

DEER CREEK TRIBUTARY 3

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
Deer Creek Tributary 3 West Branch								
A[2]	14,500	359	595	2.20	1,146.7	1,146.7	1,146.7	0.0
B[2]	15,600	471	1,065	1.20	1,147.2	1,147.2	1,147.2	0.0
C[2]	15,850	206	468	2.80	1,147.5	1,147.5	1,147.5	0.0
D	15,980	80	501	2.60	1,153.2	1,153.2	1,153.4	0.2
E	18,220	80	181	7.20	1,167.7	1,167.7	1,167.9	0.2
F	20,530	90	323	4.00	1,185.9	1,185.9	1,186.6	0.7

[1]Feet above confluence with Deer Creek Tributary 3.
[2] Located outside of Canadian County boundary.

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

CANADIAN COUNTY, OK

AND INCORPORATED AREAS

FLOODWAY DATA

DEER CREEK TRIBUTARY 3 WEST BRANCH

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
Deer Creek Tributary 4								
A	4,500	35	114	4.2	1,110.0	1,110.0	1,110.5	0.5
B	5,280	35	92	5.1	1,115.3	1,115.3	1,115.3	0.0
C	6,075	1,232	7,226	0.4	1,130.2	1,130.2	1,131.1	0.9
D	7,390	630	1,631	1.6	1,130.2	1,130.2	1,131.1	0.9
E	8,690	210	420	6.4	1,138.0	1,138.0	1,138.0	0.0
F	11,270	200	900	3.0	1,152.3	1,152.3	1,153.1	0.8
G	12,350	190	353	5.7	1,157.4	1,157.4	1,157.4	0.0
H	14,310	105	445	4.5	1,166.9	1,166.9	1,167.2	0.3
I	14,387	105	507	3.9	1,169.8	1,169.8	1,170.0	0.2
J	15,790	90	123	8.0	1,177.6	1,177.6	1,177.6	0.0

[1]Feet above confluence with Deer Creek.

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
Deer Creek Tributary 5								
A	3,720	85	377	6.60	1,111.4	1,111.4	1,111.5	0.1
B	5,480	85	505	5.00	1,118.5	1,118.5	1,119.3	0.8
C	5,630	120	858	2.91	1,123.5	1,123.5	1,124.1	0.6
D	7,270	160	756	3.31	1,125.7	1,125.7	1,126.6	0.9
E	8,350	236	457	5.47	1,132.0	1,132.0	1,132.2	0.2
F	10,230	240	725	3.45	1,144.8	1,144.8	1,145.8	1.0
G	13,170	100	329	4.65	1,158.0	1,158.0	1,158.9	0.9
H	14,680	62	210	7.30	1,171.9	1,171.9	1,171.9	0.0
I	14,750	100	313	4.88	1,173.0	1,173.0	1,173.1	0.1
J	15,600	100	362	4.23	1,176.7	1,176.7	1,177.5	0.8
K	15,690	100	424	3.61	1,180.3	1,180.3	1,181.0	0.7
L	16,700	60	234	6.52	1,185.6	1,185.6	1,185.8	0.2
M	18,210	60	329	4.64	1,196.7	1,196.7	1,196.8	0.1

[1]Feet above confluence with Deer Creek.

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

CANADIAN COUNTY, OK

AND INCORPORATED AREAS

FLOODWAY DATA

DEER CREEK TRIBUTARY 5

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
Deer Creek Tributary 5A								
A	670	329	735	1.60	1,156.8	1,156.8	1,157.8	1.0
B	1,100	100	353	3.30	1,157.1	1,157.1	1,158.1	1.0
C	2,280	46	125	9.30	1,163.3	1,163.3	1,164.3	1.0
D	2,850	84	371	3.10	1,165.9	1,165.9	1,166.9	1.0
E	4,010	53	101	7.90	1,176.0	1,176.0	1,176.7	0.7
F	4,950	85	201	3.30	1,186.2	1,186.2	1,187.0	0.8
G	5,880	59	200	2.80	1,189.3	1,189.3	1,190.3	1.0
H	6,560	25	73	6.10	1,194.5	1,194.5	1,195.5	1.0
I	6,980	40	55	5.90	1,198.8	1,198.8	1,199.4	0.6

[1]Feet above confluence with Deer Creek Tributary 5.

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

CANADIAN COUNTY, OK

AND INCORPORATED AREAS

FLOODWAY DATA

DEER CREEK TRIBUTARY 5A

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
Deer Creek Tributary 6								
A	1,390	145	384	4.9	1,112.4	1,112.4	1,112.6	0.2
B	3,590	100	441	4.3	1,124.2	1,124.2	1,124.9	0.7
C	5,150	100	311	6.0	1,133.9	1,133.9	1,134.4	0.5
D	5,695	100	437	4.3	1,137.4	1,137.4	1,137.8	0.4
E	6,735	100	363	5.2	1,141.2	1,141.2	1,141.8	0.6

[1]Feet above confluence with Deer Creek.

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

CANADIAN COUNTY, OK

AND INCORPORATED AREAS

FLOODWAY DATA

DEER CREEK TRIBUTARY 6

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
Deer Creek Tributary 7								
A	1,885	100	596	4.5	1,116.7	1,116.7	1,116.9	0.2
B	3,860	70	296	9.1	1,124.6	1,124.6	1,124.6	0.0
C	4,015	70	298	9.0	1,126.7	1,126.7	1,126.7	0.0
D	5,435	70	512	5.3	1,135.3	1,135.3	1,135.5	0.2
E	6,665	70	310	8.7	1,139.6	1,139.6	1,139.8	0.2
F	7,975	70	383	7.0	1,149.2	1,149.2	1,149.2	0.0
G	9,070	70	418	6.4	1,155.5	1,155.5	1,156.0	0.5
H	9,950	70	355	7.6	1,159.8	1,159.8	1,160.6	0.8
I	10,195	105	366	7.4	1,161.3	1,161.3	1,162.2	0.9
J	10,295	110	531	5.1	1,167.4	1,167.4	1,167.4	0.0
K	10,360	110	980	2.7	1,167.5	1,167.5	1,167.6	0.1
L	10,485	426	388	6.9	1,169.1	1,169.1	1,169.1	0.0
M	11,105	128	557	4.8	1,172.8	1,172.8	1,172.8	0.0
N	11,345	120	479	3.7	1,173.4	1,173.4	1,173.4	0.0
O-W[2]								

[1] Feet above confluence with Deer Creek.
[2] No data available.

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

CANADIAN COUNTY, OK

AND INCORPORATED AREAS

FLOODWAY DATA

DEER CREEK TRIBUTARY 7

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
Deer Creek Tributary 8								
A	2,600	85	471	7.3	1,129.6	1,129.6	1,129.6	0.0
B	4,020	85	424	8.1	1,139.7	1,139.7	1,139.8	0.1
C	5,780	126	607	5.6	1,149.6	1,149.6	1,150.3	0.7
D	5,940	60	468	7.3	1,150.5	1,150.5	1,150.9	0.4
E	6,890	60	549	6.2	1,154.2	1,154.2	1,154.9	0.7
F	9,805	70	398	8.6	1,170.1	1,170.1	1,170.4	0.3
G	11,960	61	430	8.0	1,185.3	1,185.3	1,186.3	1.0
H	12,200	97	773	4.4	1,186.6	1,186.6	1,187.6	1.0
I	14,950	48	180	8.7	1,198.6	1,198.6	1,198.7	0.1

[1]Feet above confluence with Deer Creek.

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

CANADIAN COUNTY, OK

AND INCORPORATED AREAS

FLOODWAY DATA

DEER CREEK TRIBUTARY 8

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
East Branch Turtle Creek								
A	500	65	391	7.4	1,281.1	1,281.1	1,282.0	0.9
B	760	68	417	6.7	1,282.5	1,282.5	1,283.2	0.7
C	1,500	104	532	5.3	1,286.2	1,286.2	1,286.5	0.3
D	1,700	43	287	9.8	1,286.7	1,286.7	1,286.7	0.0
E	2,140	193	943	3.4	1,288.4	1,288.4	1,289.4	1.0
F	2,700	40	467	4.7	1,289.5	1,289.5	1,290.3	0.8
G	3,280	74	468	4.7	1,290.8	1,290.8	1,291.6	0.8
H	3,980	59	250	6.4	1,293.5	1,293.5	1,294.0	0.5
I	4,460	83	398	4.0	1,296.0	1,296.0	1,296.7	0.7
J	4,820	60	379	2.4	1,297.7	1,297.7	1,298.4	0.7
K	4,940	95	581	1.6	1,301.8	1,301.8	1,302.4	0.6
L	5,140	85	218	4.1	1,301.9	1,301.9	1,302.0	0.1
M	5,440	23	97	9.3	1,301.9	1,301.9	1,301.9	0.0
N	5,920	20	93	9.6	1,306.4	1,306.4	1,307.1	0.7
O	6,040	77	119	7.6	1,307.2	1,307.2	1,307.2	0.0
P	6,500	17	76	11.9	1,313.5	1,313.5	1,313.5	0.0
Q	6,840	16	74	12.2	1,318.3	1,318.3	1,318.3	0.0
R	7,200	30	91	9.9	1,322.7	1,322.7	1,323.0	0.3

[1]Feet above confluence with Main Stem Turtle Creek.

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

CANADIAN COUNTY, OK

AND INCORPORATED AREAS

FLOODWAY DATA

EAST BRANCH TURTLE CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
Holly Branch of Middle Branch Turtle Creek								
A	470	132	462	2.6	1,319.0	1,319.0	1,319.4	0.4
B	635	105	237	5.1	1,320.0	1,320.0	1,320.0	0.0
C	980	62	272	4.4	1,326.5	1,326.5	1,327.0	0.5
D	1,400	52	270	4.5	1,333.7	1,333.7	1,334.6	0.9
E	1,680	33	157	7.7	1,336.5	1,336.5	1,337.1	0.6
F	2,015	20	106	11.4	1,338.7	1,338.7	1,338.9	0.2

[1]Feet above confluence with Middle Branch Turtle Creek.

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

CANADIAN COUNTY, OK

AND INCORPORATED AREAS

FLOODWAY DATA

HOLLY BRANCH OF MIDDLE BRANCH TURTLE CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
Main Stem Turtle Creek								
A	300	694	2,961	2.0	1,271.9	1,271.9	1,272.6	0.7
B	1,200	360	1,338	3.6	1,274.6	1,274.6	1,275.3	0.7
C	2,560	614	1,468	3.3	1,277.2	1,277.2	1,278.0	0.8
D	3,000	388	774	4.4	1,278.8	1,278.8	1,279.3	0.5
E	3,620	51	263	12.2	1,281.4	1,281.4	1,281.4	0.0
F	4,120	137	890	3.6	1,287.0	1,287.0	1,287.0	0.0
G	4,560	227	1,421	2.3	1,287.2	1,287.2	1,287.4	0.2
H	4,920	106	627	5.1	1,287.9	1,287.9	1,287.9	0.0
I	5,100	126	586	5.5	1,288.1	1,288.1	1,288.3	0.2
J	5,420	202	1,027	3.1	1,290.0	1,290.0	1,290.9	0.9
K	5,700	64	514	6.2	1,290.5	1,290.5	1,291.4	0.9
L	5,780	280	985	3.3	1,292.0	1,292.0	1,292.3	0.3
M	6,120	295	1,348	2.4	1,294.0	1,294.0	1,294.1	0.1

[1]Feet above limit of study

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

CANADIAN COUNTY, OK

AND INCORPORATED AREAS

FLOODWAY DATA

MAIN STEM TURTLE CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
Middle Branch Turtle Creek								
A	300	121	644	3.9	1,294.3	1,294.3	1,295.3	1.0
B	815	42	313	8.0	1,295.3	1,295.3	1,296.3	1.0
C	1,025	54	328	6.1	1,296.3	1,296.3	1,297.2	0.9
D	1,700	65	357	5.6	1,298.3	1,298.3	1,299.3	1.0
E	2,150	72	359	5.6	1,299.2	1,299.2	1,300.1	0.9
F	2,265	74	304	6.6	1,300.0	1,300.0	1,300.5	0.5
G	2,400	34	163	12.2	1,300.4	1,300.4	1,300.4	0.0
H	2,700	36	164	12.2	1,301.4	1,301.4	1,301.4	0.0
I	3,200	35	162	12.3	1,303.8	1,303.8	1,303.8	0.0
J	3,500	30	155	12.9	1,308.1	1,308.1	1,308.1	0.0
K	3,626	34	161	12.4	1,310.6	1,311.1	1,310.6	0.0
L	3,800	35	164	12.2	1,311.5	1,311.5	1,311.5	0.0
M	4,160	105	457	4.4	1,314.2	1,314.2	1,314.6	0.4
N	4,400	69	304	5.3	1,314.6	1,314.6	1,314.9	0.3
O	4,800	108	390	4.1	1,316.5	1,316.5	1,317.4	0.9
P	5,300	142	425	3.8	1,319.2	1,319.2	1,319.7	0.5
Q	6,060	35	193	8.3	1,322.3	1,322.3	1,322.7	0.4
R[2]	--	--	--	--	--	--	--	--
S[2]	--	--	--	--	--	--	--	--
T[2]	--	--	--	--	--	--	--	--

[1]Feet above confluence with Main Stem Turtle Creek.
[2]No data available.

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

CANADIAN COUNTY, OK

AND INCORPORATED AREAS

FLOODWAY DATA

MIDDLE BRANCH TURTLE CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
Mustang Creek								
A	10,000	100	1,628	6.6	1,238.2	1,238.2	1,238.7	0.5
B	13,870	130	2,355	4.0	1,240.6	1,240.6	1,240.9	0.3
C	16,540	160	2,035	4.7	1,240.9	1,240.9	1,241.6	0.7
D	20,830	60	593	2.1	1,243.8	1,243.8	1,244.6	0.8
E	22,670	40	297	4.3	1,244.6	1,244.6	1,245.4	0.8
F	22,850	50	716	9.6	1,244.9	1,244.9	1,245.6	0.7
G	26,240	115	1,796	3.8	1,253.6	1,253.6	1,253.6	0.0
H	29,300	300	666	10.3	1,265.4	1,265.4	1,265.8	0.4
I	33,100	100	978	4.6	1,273.1	1,273.1	1,273.7	0.6
J	35,140	100	686	6.6	1,280.6	1,280.6	1,281.0	0.4
K	38,320	150	1,386	3.3	1,285.9	1,285.9	1,286.8	0.9
L	38,460	130	873	5.8	1,289.6	1,289.6	1,290.5	0.9
M[2]								
N	41,150	80	475	4.8	1,300.2	1,300.2	1,301.1	0.9
O	42,650	60	347	6.6	1,304.8	1,304.8	1,305.7	0.9

[1]Feet above confluence with North Canadian River.
[2]No data available

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
Mustang Creek New Channel								
A	1,150	152	1,496	7.2	1,241.4	1,241.4	1,242.1	0.7
B	2,150	164	1,381	7.8	1,243.9	1,243.9	1,244.2	0.3

[1]Feet above confluence with Mustang Creek.

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

CANADIAN COUNTY, OK

AND INCORPORATED AREAS

FLOODWAY DATA

MUSTANG CREEK NEW CHANNEL

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
Mustang Creek Tributary 1								
A	2,220	120	1,307	2.40	1241.7	1241.7	1242.7	1.0
B	6,760	40	341	10.90	1247.9	1247.9	1248.7	0.8
C	10,445	80	622	6.00	1261.4	1261.4	1262.4	1.0
D	10,840	140	351	10.60	1263.6	1263.6	1263.6	0.0
E	11,030	60	401	9.30	1265.0	1265.0	1265.9	0.9
F	13,460	120	674	5.50	1273.0	1273.0	1274.0	1.0
G	17,170	163	1,230	1.50	1291.1	1291.1	1291.7	0.6
H	17,820	26	139	8.20	1293.1	1293.1	1293.1	0.0
I	20,470	72	180	6.30	1309.7	1309.7	1310.1	0.4
J	22,500	36	140	8.10	1327.5	1327.5	1327.9	0.4

[1]Feet above confluence with Mustang Creek.

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

CANADIAN COUNTY, OK

AND INCORPORATED AREAS

FLOODWAY DATA

MUSTANG CREEK TRIBUTARY 1

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
Mustang Creek Tributary 1 East Branch								
A	1,040	57	298	3.90	1,295.0	1,295.0	1,296.0	1.0

[1]Feet above confluence with Mustang Creek Tributary 1.

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

CANADIAN COUNTY, OK

AND INCORPORATED AREAS

FLOODWAY DATA

MUSTANG CREEK TRIBUTARY 1 EAST BRANCH

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
Mustang Creek Tributary 1 West Branch								
A	3,370	50	172	7.8	1,292.4	1,292.4	1,292.8	0.4
B	4,850	60	235	5.7	1,302.1	1,302.1	1,303.0	0.9

[1]Feet above confluence with Mustang Creek Tributary 1.

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

CANADIAN COUNTY, OK

AND INCORPORATED AREAS

FLOODWAY DATA

MUSTANG CREEK TRIBUTARY 1 WEST BRANCH

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
Mustang Creek Tributary 2								
A	3,320	160	700	7.4	1,255.7	1,255.7	1,256.5	0.8
B	6,380	400	1,623	3.2	1,265.0	1,265.0	1,266.0	1.0
C	9,880	160	987	5.3	1,271.4	1,271.4	1,272.2	0.8
D	12,160	110	835	6.2	1,276.6	1,276.6	1,277.6	1.0
E	13,340	100	737	4.9	1,279.4	1,279.4	1,279.9	0.5
F	13,460	100	632	5.7	1,279.4	1,279.4	1,279.9	0.5
G	16,280	100	550	6.6	1,286.4	1,286.4	1,287.4	1.0
H	20,100	45	386	6.1	1,297.4	1,297.4	1,297.8	0.4
I	20,200	50	401	5.9	1,297.8	1,297.8	1,298.1	0.3
J	21,920	50	278	8.5	1,304.0	1,304.0	1,304.5	0.5

[1]Feet above confluence with Mustang Creek New Channel.

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

CANADIAN COUNTY, OK

AND INCORPORATED AREAS

FLOODWAY DATA

MUSTANG CREEK TRIBUTARY 2

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
Mustang Creek Tributary 2 South Branch								
A	970	80	452	5.3	1,111.4	1,111.4	1,111.5	0.1
B	2,700	60	355	6.7	1,118.5	1,118.5	1,119.3	0.8
C	3,600	100	590	4.5	1,288.3	1,288.3	1,289.1	0.8
D	3,800	100	737	3.6	1,288.5	1,288.5	1,289.4	0.9
E	4,950	74	253	10.5	1,291.4	1,291.4	1,291.4	0.0
F	6,160	50	297	8.9	1,300.8	1,300.8	1,301.5	0.7
G	7,820	80	379	7.0	1,308.8	1,308.8	1,309.5	0.7
H	9,220	60	233	11.4	1,318.8	1,318.8	1,318.8	0.0

[1]Feet above confluence with Mustang Creek Tributary 2.

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
Mustang Creek Tributary 3								
A	2,770	95	901	4.2	1,265.0	1,265.0	1,265.1	0.1
B	4,150	75	554	6.8	1,266.4	1,266.4	1,266.8	0.4
C	5,030	300	909	4.2	1,268.0	1,268.0	1,268.8	0.8
D	6,450	45	372	10.1	1,271.3	1,271.3	1,271.7	0.4
E	10,470	55	415	6.6	1,284.6	1,284.6	1,285.4	0.8
F	11,800	35	263	10.5	1,289.4	1,289.4	1,289.8	0.4
G	13,940	210	710	3.9	1,297.7	1,297.7	1,298.2	0.5
H	16,770	70	223	8.8	1,310.7	1,310.7	1,310.9	0.2
I	18,220	40	339	5.8	1,320.7	1,320.7	1,320.9	0.2

[1]Feet above confluence with Mustang Creek.

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
Mustang Creek Tributary 3 East Branch								
A	1,680	122	744	2.9	1,270.9	1,270.9	1,271.2	0.3
B	4,420	124	330	6.6	1,278.4	1,278.4	1,278.4	0.0
C	4,510	100	327	6.7	1,280.9	1,280.9	1,280.9	0.0
D	6,610	126	244	5.0	1,291.0	1,291.0	1,291.0	0.0

[1]Feet above confluence with Mustang Creek Tributary 3.

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

CANADIAN COUNTY, OK

AND INCORPORATED AREAS

FLOODWAY DATA

MUSTANG CREEK TRIBUTARY 3 EAST BRANCH

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
Mustang Creek Tributary 3 West Branch								
A	2,080	45	190	6.3	1,293.9	1,293.9	1,294.3	0.4
B	4,030	30	156	7.7	1,309.5	1,309.5	1,310.5	1.0
C	4,860	35	157	7.6	1,318.5	1,318.5	1,319.1	0.6

[1]Feet above confluence with Mustang Creek Tributary 3.

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

CANADIAN COUNTY, OK

AND INCORPORATED AREAS

FLOODWAY DATA

MUSTANG CREEK TRIBUTARY 3 WEST BRANCH

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
Mustang Creek Tributary 4								
A	1,300	70	517	4.3	1,300.4	1,300.4	1,300.4	0.0
B	4,200	30	258	4.4	1,305.9	1,305.9	1,306.3	0.4
C	4,540	40	475	2.4	1,312.3	1,312.3	1,312.7	0.4
D	6,760	32	355	3.2	1,313.2	1,313.2	1,313.8	0.6

[1]Feet above confluence with Mustang Creek.

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

CANADIAN COUNTY, OK

AND INCORPORATED AREAS

FLOODWAY DATA

MUSTANG CREEK TRIBUTARY 4

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
North Canadian River								
GV	1,459,392	1,342	15,267	3.1	1,224.7	1,224.7	1,225.7	1.0
GW	1,460,501	2,071	20,401	2.3	1,225.3	1,225.3	1,226.3	1.0
GX	1,461,926	2,122	20,727	2.3	1,225.7	1,225.7	1,226.7	1.0
GY	1,461,979	832	12,045	3.9	1,225.7	1,225.7	1,226.7	1.0
GZ	1,462,138	726	12,874	3.6	1,225.9	1,225.9	1,226.9	1.0
HA	1,462,824	1,881	16,515	2.8	1,226.0	1,226.0	1,227.0	1.0
HB	1,463,827	1,288	15,109	3.1	1,226.5	1,226.5	1,227.5	1.0
HC	1,463,933	685	10,085	4.6	1,226.5	1,226.5	1,227.5	1.0
HD	1,464,038	685	10,107	4.6	1,226.5	1,226.5	1,227.5	1.0
HE	1,464,936	1,489	21,263	2.2	1,227.4	1,227.4	1,228.3	0.9
HF	1,465,728	684	8,437	5.5	1,228.1	1,228.1	1,228.5	0.4
HG	1,465,781	392	6,282	7.4	1,228.3	1,228.3	1,228.7	0.4
HH	1,465,834	793	10,211	4.6	1,228.4	1,228.4	1,229.4	1.0
HI	1,469,002	1,597	25,471	1.8	1,229.4	1,229.4	1,230.4	1.0
HJ	1,471,061	1,602	27,227	1.7	1,229.6	1,229.6	1,230.6	1.0
HK	1,471,747	896	12,957	3.6	1,229.7	1,229.7	1,230.7	1.0
HL	1,471,906	581	9,876	4.7	1,229.7	1,229.7	1,230.7	1.0
HM	1,472,011	1,081	9,019	5.2	1,230.5	1,230.5	1,231.2	0.7
HN	1,472,856	1,188	11,074	4.2	1,231.7	1,231.7	1,232.5	0.8
HO	1,473,754	974	15,702	3.0	1,232.5	1,232.5	1,233.4	0.9
HP[2]	1,485,053	974	15,702	3.0	1,247.4	1,247.4	1,248.3	0.9
HQ[2]	1,485,106	800	7,936	5.7	1,247.8	1,247.8	1,248.6	0.8
HR	1,485,264	788	7,936	5.7	1,247.8	1,247.8	1,248.7	0.9

[1]Feet above mouth

[2] Located outside of Canadian County boundary

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

CANADIAN COUNTY, OK

AND INCORPORATED AREAS

FLOODWAY DATA

NORTH CANADIAN RIVER

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
North Canadian River (cont)								
HS[2]	1,485,370	788	7,954	5.7	1,247.9	1,247.9	1,248.7	0.8
HT	1,490,861	4,228	36,529	1.2	1,251.3	1,251.3	1,252.2	0.9
HU	1,498,781	4,345	48,024	0.9	1,252.9	1,252.9	1,253.6	0.7
HV	1,505,280	8,328	29,350	1.5	1,254.3	1,254.3	1,255.2	0.9
HW	1,505,328	7,729	22,401	2.0	1,254.4	1,254.4	1,255.3	0.9
HX	1,505,434	7,800	25,750	1.7	1,254.5	1,254.5	1,255.4	0.9
HY	1,510,186	8,291	24,565	1.8	1,257.6	1,257.6	1,258.6	1.0
HZ	1,513,512	4,988	23,165	1.9	1,260.0	1,260.0	1,261.0	1.0
IA	1,517,050	5,280	27,224	1.60	1,261.3	1,261.3	1,262.3	1.0
IB	1,519,954	2,600	14,942	3.00	1,262.7	1,262.7	1,263.7	1.0
IC	1,522,646	3,255	14,380	3.10	1,265.8	1,265.8	1,266.8	1.0
ID	1,525,498	5,707	30,332	1.20	1,267.8	1,267.8	1,268.5	0.7
IE	1,528,401	1,827	11,938	3.60	1,268.7	1,268.7	1,269.4	0.7
IF	1,531,886	4,212	26,442	1.90	1,271.0	1,271.0	1,271.7	0.7
IG	1,535,424	7,238	39,641	1.10	1,271.5	1,271.5	1,272.3	0.8
IH	1,538,592	1,979	10,375	4.20	1,272.2	1,272.2	1,273.0	0.8
II	1,541,338	3,562	19,481	2.20	1,274.7	1,274.7	1,275.7	1.0
IJ	1,544,030	2,404	13,580	3.20	1,276.7	1,276.7	1,277.7	1.0
IK	1,546,723	2,600	18,041	2.40	1,278.6	1,278.6	1,279.6	1.0
IL	1,549,627	1,573	12,775	3.40	1,280.2	1,280.2	1,281.2	1.0
IM	1,552,531	4,033	28,816	1.5	1,281.3	1,281.3	1,282.3	1.0
IN	1,555,910	5,960	26,307	1.6	1,282.0	1,282.0	1,283.0	1.0

[1]Feet above mouth
[2] Located outside of Canadian County boundary

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY
CANADIAN COUNTY, OK
AND INCORPORATED AREAS

FLOODWAY DATA

NORTH CANADIAN RIVER

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
North Canadian River Tributary A								
A	190	318	1,615	0.90	1,259.7	1,259.7	1,260.7	1.0
B	480	172	976	1.50	1,259.7	1,259.7	1,260.7	1.0
C	1,290	120	525	2.90	1,259.7	1,259.7	1,260.7	1.0
D	2,050	109	426	3.50	1,261.3	1,261.3	1,261.7	0.4
E	2,620	94	417	3.60	1,262.0	1,262.0	1,262.2	0.2
F	3,190	106	327	4.60	1,265.4	1,265.4	1,265.5	0.1
G	3,640	59	175	8.60	1,268.1	1,268.1	1,268.6	0.5
H	5,000	51	131	9.00	1,273.6	1,273.6	1,274.3	0.7
I	6,000	35	126	9.30	1,277.9	1,277.9	1,278.0	0.1
J	6,990	97	268	4.40	1,283.3	1,283.3	1,284.3	1.0
K	7,930	15	401	13.60	1,289.7	1,289.7	1,289.7	0.0
L	8,200	188	1,275	0.90	1,295.2	1,295.2	1,295.2	0.0
M	8,555	220	668	1.20	1,295.5	1,295.5	1,295.5	0.0
N	8,640	275	392	2.1	1,296.6	1,296.6	1,296.6	0.0
O	8,880	21	29	6.8	1,297.8	1,297.8	1,297.8	0.0

[1]Feet above Sara Road.

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

CANADIAN COUNTY, OK

AND INCORPORATED AREAS

FLOODWAY DATA

NORTH CANADIAN RIVER TRIBUTARY A

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
North Canadian River Tributary B West Branch								
A	235	173	632	1.00	1,291.1	1,291.1	1,291.1	0.0
B	750	84	326	1.80	1,296.0	1,296.0	1,296.0	0.9
C	1,200	44	139	2.70	1,303.0	1,303.0	1,303.9	0.9

[1]Feet above confluence with North Canadian River.

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

CANADIAN COUNTY, OK

AND INCORPORATED AREAS

FLOODWAY DATA

NORTH CANADIAN RIVER TRIBUTARY B WEST BRANCH

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
North Canadian River Tributary C								
A	100	140	4,900	1.2	1,286.2	1,286.2	1,286.2	0.0
B	680	220	1,337	1.5	1,286.2	1,286.2	1,286.2	0.0
C	1,040	160	913	2.2	1,286.2	1,286.2	1,286.2	0.0
D	1,340	172	1,433	1.4	1,289.2	1,289.2	1,289.2	0.0
E	1,640	88	664	2.0	1,289.2	1,289.2	1,289.2	0.0
F	2,200	58	600	2.2	1,289.5	1,289.5	1,289.6	0.1
G	2,930	34	201	6.5	1,291.7	1,291.7	1,291.8	0.1
H	3,520	50	254	5.1	1,296.9	1,296.9	1,297.6	0.7
I	4,080	51	290	4.5	1,301.5	1,301.5	1,302.1	0.6
J	4,460	38	185	7.0	1,304.0	1,304.0	1,304.2	0.2
K	4,560	30	102	8.3	1,309.5	1,309.5	1,310.0	0.5

[1]Feet above confluence with North Canadian River.

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
North Canadian River Tributary B								
A	1,600	382	2,490	0.6	1,286.8	1,286.8	1,286.8	0.0
B	2,050	249	989	1.4	1,286.8	1,286.8	1,286.8	0.0
C	2,260	174	600	2.3	1,286.9	1,286.9	1,286.9	0.0
D	2,580	211	890	1.4	1,291.0	1,291.0	1,291.0	0.0
E	3,240	122	561	2.1	1,294.5	1,294.5	1,295.5	1.0
F	3,580	85	426	2.8	1,297.9	1,297.9	1,298.9	1.0

[1]Feet above confluence with North Canadian River.

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

CANADIAN COUNTY, OK

AND INCORPORATED AREAS

FLOODWAY DATA

NORTH CANADIAN RIVER TRIBUTARY B

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
North Canadian River Tributary C								
A	100	140	4,900	1.2	1,286.2	1,286.2	1,286.2	0.0
B	680	220	1,337	1.5	1,286.2	1,286.2	1,286.2	0.0
C	1,040	160	913	2.2	1,286.2	1,286.2	1,286.2	0.0
D	1,340	172	1,433	1.4	1,289.2	1,289.2	1,289.2	0.0
E	1,640	88	664	2.0	1,289.2	1,289.2	1,289.2	0.0
F	2,200	58	600	2.2	1,289.5	1,289.5	1,289.6	0.1
G	2,930	34	201	6.5	1,291.7	1,291.7	1,291.8	0.1
H	3,520	50	254	5.1	1,296.9	1,296.9	1,297.6	0.7
I	4,080	51	290	4.5	1,301.5	1,301.5	1,302.1	0.6
J	4,460	38	185	7.0	1,304.0	1,304.0	1,304.2	0.2
K	4,560	30	102	8.3	1,309.5	1,309.5	1,310.0	0.5

[1]Feet above confluence with North Canadian River.

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
North Canadian River Tributary C West Branch #1								
A	460	48	264	1.9	1,289.3	1,289.3	1,289.3	0.0
B	960	110	158	3.2	1,293.8	1,293.8	1,294.1	0.3
C	1,720	98	142	3.5	1,302.9	1,302.9	1,303.0	0.1
D	2,340	62	78	6.4	1,311.8	1,311.8	1,312.4	0.6
E	2,840	71	98	5.1	1,320.9	1,320.9	1,321.0	0.1

[1]Feet above confluence with North Canadian River Tributary C.

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

CANADIAN COUNTY, OK

AND INCORPORATED AREAS

FLOODWAY DATA

NORTH CANADIAN RIVER TRIBUTARY C WEST BRANCH #1

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
North Canadian River Tributary C West Branch #2								
A	270	23	140	4.30	1,318.2	1,318.2	1,318.7	0.5
B	590	37	90	6.70	1,320.3	1,320.3	1,320.3	0.0
C	920	22	63	9.60	1,327.1	1,327.1	1,327.1	0.0
D	1,170	20	90	6.60	1,332.2	1,332.2	1,332.3	0.1

[1]Feet above confluence with North Canadian River Tributary C.

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
Shell Creek								
A	3,090	1,850	10,179	0.7	1,275.4	1,275.4	1,276.4	1.0
B	3,240	500	4,263	1.6	1,275.9	1,275.9	1,276.7	0.8
C	4,030	210	1,318	5.3	1,275.9	1,275.9	1,276.9	1.0
D	4,680	134	1,414	4.9	1,277.4	1,277.4	1,277.9	0.5
E	4,930	170	1,561	4.5	1,277.8	1,277.8	1,278.3	0.5
F	5,480	192	1,555	4.5	1,278.4	1,278.4	1,278.8	0.4
G	8,150	200	2,603	2.7	1,279.1	1,279.1	1,280.0	0.9
H	8,530	200	2,396	2.9	1,279.3	1,279.3	1,280.1	0.8
I	9,330	150	1,088	6.4	1,279.3	1,279.3	1,280.3	1.0
J	14,310	150	1,331	5.2	1,288.6	1,288.6	1,288.8	0.2
K	17,320	150	1,239	4.9	1,292.1	1,292.1	1,292.7	0.6
L	20,530	170	1,355	4.5	1,296.3	1,296.3	1,297.0	0.7
M	20,960	150	1,528	4.0	1,296.9	1,296.9	1,297.7	0.8
N	22,060	154	1,216	4.3	1,298.2	1,298.2	1,298.8	0.6
O	26,270	160	1,403	3.7	1,302.2	1,302.2	1,302.8	0.6
P	28,180	160	1,122	4.7	1,304.9	1,304.9	1,305.3	0.4
Q	28,340	140	1,068	4.9	1,305.3	1,305.3	1,305.6	0.3
R	30,690	150	1,075	4.9	1,308.1	1,308.1	1,308.5	0.4
S	33,900	125	816	4.6	1,312.9	1,312.9	1,313.4	0.5
T	35,450	250	1,037	3.6	1,315.8	1,315.8	1,316.3	0.5
U	36,260	150	745	5.0	1,317.8	1,317.8	1,318.4	0.6
V	36,860	225	980	3.8	1,319.6	1,319.6	1,319.7	0.1
W	38,430	175	1,010	2.7	1,321.1	1,321.1	1,321.9	0.8

[1]Feet above confluence with North Canadian River.

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
Shell Creek (Cont'd)								
X	42,110	80	368	7.5	1,328.2	1,328.2	1,328.8	0.6
Y	43,400	94	647	4.3	1,330.8	1,330.8	1,331.6	0.8
Z	44,250	100	542	5.1	1,332.2	1,332.2	1,332.8	0.6
AA	44,760	200	2,093	1.3	1,332.7	1,332.7	1,333.5	0.8
AB	45,800	150	1,348	2.1	1,332.7	1,332.7	1,333.6	0.9
AC	47,140	100	298	6.1	1,334.6	1,334.6	1,335.6	1.0

[1]Feet above confluence with North Canadian River.

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
Shell Creek Tributary 1								
A	1,240	200	744	1.5	1,284.6	1,284.6	1,284.6	0.0
B	2,020	121	389	2.9	1,285.1	1,285.1	1,285.2	0.1
C	2,980	148	190	6.0	1,294.5	1,294.5	1,294.5	0.0
D	4,570	150	694	1.7	1,299.4	1,299.4	1,299.7	0.3
E	5,630	50	221	5.2	1,306.0	1,306.0	1,306.1	0.1
F	5,760	50	461	2.5	1,308.0	1,308.0	1,308.0	0.0

[1]Feet above confluence with Shell Creek.

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

CANADIAN COUNTY, OK

AND INCORPORATED AREAS

FLOODWAY DATA

SHELL CREEK TRIBUTARY 1

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
Shell Creek Tributary 2								
A	1,240	144	769	1.9	1,290.2	1,290.2	1,290.6	0.4
B	2,020	100	333	4.3	1,290.6	1,290.6	1,290.9	0.3
C	2,150	80	411	3.5	1,291.6	1,291.6	1,291.6	0.0
D	3,700	50	278	5.2	1,298.3	1,298.3	1,298.6	0.3
E	5,470	85	216	6.7	1,308.6	1,308.6	1,309.0	0.4

[1]Feet above confluence with Shell Creek.

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

CANADIAN COUNTY, OK

AND INCORPORATED AREAS

FLOODWAY DATA

SHELL CREEK TRIBUTARY 2

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
Shell Creek Tributary 3								
A	800	225	1,840	1.2	1,289.8	1,289.8	1,290.5	0.7
B	2,530	80	339	6.3	1,291.2	1,291.2	1,291.9	0.7
C	3,180	90	434	4.9	1,295.7	1,295.7	1,295.8	0.1
D	3,320	90	431	5.0	1,296.0	1,296.0	1,296.1	0.1
E	4,320	80	352	6.1	1,297.8	1,297.8	1,297.8	0.0
F	6,060	80	304	7.1	1,302.9	1,302.9	1,302.9	0.0
G	6,180	80	579	3.7	1,304.1	1,304.1	1,304.1	0.0
H	7,500	80	284	7.6	1,306.7	1,306.7	1,307.1	0.4
I	9,660	80	438	4.0	1,316.0	1,316.0	1,316.0	0.0
J	11,300	50	224	7.9	1,321.0	1,321.0	1,321.0	0.0
K	13,420	50	286	3.7	1,331.0	1,331.0	1,331.8	0.8
L	13,740	50	256	4.2	1,331.9	1,331.9	1,332.7	0.8
M	15,860	30	133	8.1	1,343.6	1,343.6	1,343.9	0.3

[1]Feet above confluence with Shell Creek.

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

CANADIAN COUNTY, OK

AND INCORPORATED AREAS

FLOODWAY DATA

SHELL CREEK TRIBUTARY 3

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
Shell Creek Tributary 4								
A	920	102	949	2.5	1,298.1	1,298.1	1,298.8	0.7
B	1,400	176	1,572	1.1	1,298.2	1,298.2	1,298.9	0.7
C	1,540	268	276	6.5	1,300.8	1,300.8	1,301.0	0.2
D	1,650	310	1,256	1.4	1,301.3	1,301.3	1,301.8	0.5
E	2,310	420	1,626	1.1	1,301.4	1,301.4	1,301.8	0.4
F	3,660	189	407	4.4	1,303.8	1,303.8	1,303.8	0.0
G	5,280	308	1,163	1.6	1,306.1	1,306.1	1,306.1	0.0
H	5,510	381	541	3.3	1,306.2	1,306.2	1,306.2	0.0
I	7,780	70	335	5.4	1,312.6	1,312.6	1,313.0	0.4
J	7,900	70	407	4.4	1,312.9	1,312.9	1,313.5	0.6
K	10,280	120	421	3.3	1,318.5	1,318.5	1,318.9	0.4
L	11,560	226	396	3.5	1,321.7	1,321.7	1,321.7	0.0
M	13,490	100	261	5.3	1,326.2	1,326.2	1,326.2	0.0
N	13,600	219	193	7.2	1,328.3	1,328.3	1,328.3	0.0
O	14,190	701	998	1.4	1,331.8	1,331.8	1,331.9	0.1

[1]Feet above confluence with Shell Creek.

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
Shell Creek Tributary 4 West Branch								
A	1,220	148	504	2.6	1,299.3	1,299.3	1,299.8	0.5
B	1,560	160	527	2.5	1,299.7	1,299.7	1,300.1	0.4
C	3,020	70	179	7.4	1,304.8	1,304.8	1,304.8	0.0

[1]Feet above confluence with Shell Creek Tributary 4.

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

CANADIAN COUNTY, OK

AND INCORPORATED AREAS

FLOODWAY DATA

SHELL CREEK TRIBUTARY 4 WEST BRANCH

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
Shell Creek Tributary 5								
A	2,590	75	613	4.5	1,313.2	1,313.2	1,314.0	0.8
B	2,635	60	460	6.0	1,313.2	1,313.2	1,314.1	0.9
C	3,460	150	861	3.2	1,315.7	1,315.7	1,316.3	0.6
D	4,720	80	408	4.5	1,317.7	1,317.7	1,318.0	0.3
E	6,250	75	225	8.2	1,322.6	1,322.6	1,322.6	0.0
F	6,295	150	794	2.3	1,324.9	1,324.9	1,324.9	0.0
G	7,780	50	218	8.4	1,326.7	1,326.7	1,327.1	0.4
H	9,120	192	794	1.8	1,331.5	1,331.5	1,332.4	0.9
I	9,200	156	299	4.9	1,331.9	1,331.9	1,332.4	0.5
J	9,290	100	270	5.4	1,332.7	1,332.7	1,332.7	0.0
K	9,870	236	401	3.6	1,333.9	1,333.9	1,334.0	0.1
L	12,340	70	238	5.1	1,340.6	1,340.6	1,340.6	0.0
M	12,500	100	358	3.4	1,341.1	1,341.1	1,341.1	0.0

[1]Feet above confluence with Shell Creek.

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

CANADIAN COUNTY, OK

AND INCORPORATED AREAS

FLOODWAY DATA

SHELL CREEK TRIBUTARY 5

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
Shell Creek Tributary 5 East Branch								
A	1,530	150	501	3.0	1,319.8	1,319.8	1,320.0	0.2
B	4,130	92	318	4.8	1,327.4	1,327.4	1,327.4	0.0
C	5,910	109	311	4.9	1,332.8	1,332.8	1,332.8	0.0

[1]Feet above confluence with Shell creek Tributary 5.

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

CANADIAN COUNTY, OK

AND INCORPORATED AREAS

FLOODWAY DATA

SHELL CREEK TRIBUTARY 5 EAST BRANCH

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
Shell Creek Tributary 6								
A	1,340	90	549	3.2	1,322.1	1,322.1	1,323.1	1.0
B	2,530	70	287	6.1	1,326.1	1,326.1	1,326.2	0.1
C	5,080	90	374	3.9	1,333.6	1,333.6	1,334.1	0.5
D	5,240	150	744	2.0	1,334.0	1,334.0	1,334.5	0.5
E	7,300	100	355	4.1	1,339.6	1,339.6	1,339.8	0.2
F	7,440	225	313	4.7	1,340.6	1,340.6	1,340.6	0.0
G	9,180	75	364	4.0	1,346.1	1,346.1	1,346.1	0.0
H	9,400	75	326	4.5	1,346.3	1,346.3	1,346.4	0.1

[1]Feet above confluence with Shell Creek.

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

CANADIAN COUNTY, OK

AND INCORPORATED AREAS

FLOODWAY DATA

SHELL CREEK TRIBUTARY 6

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
Soldier Creek								
A	13,860	1,536	2,505	2.6	1,081.5	1,081.5	1,081.5	0.0
B	17,140	136	810	6.7	1,088.1	1,088.1	1,088.4	0.3
C	17,240	143	1,135	4.8	1,088.8	1,088.8	1,089.0	0.2
D	19,180	80	631	8.6	1,095.7	1,095.7	1,095.7	0.0
E	21,320	130	1,055	4.6	1,103.2	1,103.2	1,104.1	0.9
F	22,760	115	884	5.4	1,106.3	1,106.3	1,107.3	1.0
G	23,850	70	676	7.1	1,110.2	1,110.2	1,110.7	0.5
H	26,080	113	915	5.3	1,116.2	1,116.2	1,116.7	0.5
I	26,150	126	1,310	3.7	1,120.3	1,120.3	1,120.3	0.0
J	27,100	81	727	6.6	1,121.3	1,121.3	1,121.6	0.3
K	27,720	100	706	6.8	1,122.9	1,122.9	1,123.9	1.0
L	29,360	215	1,776	2.7	1,126.6	1,126.6	1,127.5	0.9
M	29,940	65	294	4.4	1,128.1	1,128.1	1,128.7	0.6
N	30,700	84	182	7.1	1,134.7	1,134.7	1,134.8	0.1
O	30,920	593	491	4.3	1,146.7	1,146.7	1,146.7	0.0
P	31,320	788	8,003	2.6	1,147.6	1,147.6	1,147.6	0.0
Q	32,460	170	410	5.1	1,148.7	1,148.7	1,149.2	0.5
R	32,580	177	711	2.9	1,152.1	1,152.1	1,153.1	1.0
S	33,200	110	436	4.8	1,153.7	1,153.7	1,154.1	0.4
T	34,650	98	409	5.1	1,158.2	1,158.2	1,158.5	0.3
U	35,720	110	336	6.3	1,164.1	1,164.1	1,164.4	0.3

[1]Feet above mouth.

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

CANADIAN COUNTY, OK

AND INCORPORATED AREAS

FLOODWAY DATA

SOLDIER CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
Soldier Creek South Branch								
A	760	169	--	--	1,137.4	1,137.4	1,137.4	0.0
B	1,930	141	862	2.2	1,142.3	1,142.3	1,142.4	0.1
C	3,340	130	368	5.1	1,145.4	1,145.4	1,145.5	0.1
D	3,410	180	1,170	1.7	1,150.4	1,150.4	1,150.4	0.0
E	3,720	193	--	--	1,157.8	1,157.8	1,157.8	0.0
F	5,050	189	--	--	1,159.6	1,159.6	1,159.6	0.0
G	6,120	58	254	7.4	1,160.8	1,160.8	1,161.0	0.2
H	6,740	214	1,640	1.3	1,169.2	1,169.2	1,169.5	0.3
I	7,510	69	218	10.0	1,169.2	1,169.2	1,169.7	0.5
J	8,520	121	298	7.3	1,179.3	1,179.3	1,179.7	0.4
K	9,040	116	632	2.6	1,180.1	1,180.1	1,181.0	0.9
L	10,130	78	173	8.4	1,184.1	1,184.1	1,184.4	0.3
M	11,240	30	124	11.6	1,185.3	1,185.3	1,185.4	0.1
N	11,970	99	353	4.1	1,193.5	1,193.5	1,194.3	0.8
O	13,110	63	182	7.1	1,197.5	1,197.5	1,198.2	0.7
P	14,220	62	269	4.1	1,201.1	1,201.1	1,202.1	1.0
Q	15,200	105	138	6.5	1,205.8	1,205.8	1,205.8	0.0

[1]Feet above confluence with Soldier Creek.

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

CANADIAN COUNTY, OK

AND INCORPORATED AREAS

FLOODWAY DATA

SOLDIER CREEK SOUTH BRANCH

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
Spring Creek of Deer Creek								
A	1,930	85	574	7.4	1,115.7	1,115.7	1,115.7	0.0
B	3,095	55	366	9.9	1,121.9	1,121.9	1,121.9	0.0
C	4,885	77	530	6.9	1,129.2	1,129.2	1,129.3	0.1
D	5,095	145	957	3.8	1,133.3	1,133.3	1,134.0	0.7
E	5,610	135	1,226	3.0	1,133.8	1,133.8	1,134.4	0.6
F	7,335	55	444	8.2	1,142.1	1,142.1	1,142.1	0.0
G	9,385	55	345	10.5	1,152.1	1,152.1	1,152.4	0.3
H	9,475	80	590	6.2	1,153.2	1,153.2	1,154.0	0.8
I	11,060	75	413	8.8	1,160.4	1,160.4	1,161.3	0.9
J	11,795	130	615	5.9	1,165.0	1,165.0	1,165.9	0.9
K	11,890	110	535	6.8	1,167.5	1,167.5	1,167.5	0.0
L	12,975	100	421	8.7	1,173.3	1,173.3	1,174.0	0.7
M	14,815	95	499	7.3	1,182.5	1,182.5	1,182.9	0.4
N	17,050	50	194	9.7	1,197.6	1,197.6	1,197.6	0.0
O	20,055	80	420	4.5	1,211.2	1,211.2	1,211.5	0.3
P	20,180	80	801	2.4	1,215.2	1,215.2	1,215.2	0.0

[1]Feet above confluence with Deer Creek.

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

CANADIAN COUNTY, OK

AND INCORPORATED AREAS

FLOODWAY DATA

SPRING CREEK OF DEER CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (NAVD)	WITHOUT FLOODWAY (NAVD)	WITH FLOODWAY (NAVD)	INCREASE
West Branch Turtle Creek								
A	440	108	477	3.6	1,294.0	1,294.0	1,295.0	1.0
B	650	30	151	11.2	1,294.7	1,294.7	1,295.0	0.3
C	900	75	361	4.7	1,299.4	1,299.4	1,300.1	0.7
D	1,160	29	153	11.1	1,301.2	1,301.2	1,301.4	0.2
E	1,360	62	264	6.4	1,303.5	1,303.5	1,303.9	0.4
F	1,680	54	214	7.9	1,304.6	1,304.6	1,305.2	0.6
G	1,880	27	135	12.6	1,308.6	1,308.6	1,309.0	0.4
H	2,200	50	253	4.4	1,311.4	1,311.4	1,312.1	0.7
I	2,400	20	91	12.1	1,311.6	1,311.6	1,311.6	0.0
J	2,840	28	159	6.9	1,314.2	1,314.2	1,315.0	0.8
K	3,380	39	201	5.5	1,317.2	1,317.2	1,318.1	0.9
L	3,640	21	93	11.8	1,321.2	1,321.2	1,321.8	0.6

[1]Feet above confluence with Main Stem Turtle Creek.

TABLE 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

CANADIAN COUNTY, OK

AND INCORPORATED AREAS

FLOODWAY DATA

WEST BRANCH TURTLE CREEK

5.0 INSURANCE APPLICATION

For flood insurance rating purposes, flood insurance zone designations are assigned to a community based on the results of the engineering analyses. These zones are as follows:

Zone A

Zone A is the flood insurance rate zone that corresponds to the 1-percent-annual-chance floodplains that are determined in the FIS report by approximate methods. Because detailed hydraulic analyses are not performed for such areas, no base (1-percent-annual-chance) flood elevations (BFEs) or depths are shown within this zone.

Zone AE

Zone AE is the flood insurance rate zone that corresponds to the 1-percent-annual-chance floodplains that are determined in the FIS report by detailed methods. Whole-foot BFEs derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone X

Zone X is the flood insurance rate zone that corresponds to areas outside the 0.2-percent-annual-chance floodplain, areas within the 0.2-percent-annual-chance floodplain, areas of 1-percent-annual-chance flooding where average depths are less than 1 foot, areas of 1-percent-annual-chance flooding where the contributing drainage area is less than 1 square mile (sq. mi.), and areas protected from the base flood by levees. No BFEs or depths are shown within this zone.

6.0 FLOOD INSURANCE RATE MAP

The FIRM is designed for flood insurance and floodplain management applications.

For flood insurance applications, the map designates flood insurance rate zones as described in Section 5.0 and, in the 1-percent-annual-chance floodplains that were studied by detailed methods, shows selected whole-foot BFEs or average depths. Insurance agents use zones and BFEs in conjunction with information on structures and their contents to assign premium rates for flood insurance policies.

For floodplain management applications, the map shows by tints, screens, and symbols, the 1- and 0.2-percent-annual-chance floodplains, floodways, and the locations of selected cross sections used in the hydraulic analyses and floodway computations.

The countywide FIRM presents flooding information for the entire geographic area of Canadian County. Previously, FIRMs were prepared for each incorporated community and the unincorporated areas of the County identified as flood-prone. This countywide FIRM also includes flood-hazard information that was presented separately on Flood Boundary and Floodway Maps (FBFMs), where applicable. Historical data relating to the maps prepared for each community are presented in Table 6, “Community Map History.”

7.0 OTHER STUDIES

A Flood Insurance Study has been prepared for the City of Oklahoma City (Reference 33). The results of that study are in exact agreement with the results of the study for the City of Mustang.

The stream reaches studied within the City of Piedmont are a continuation of flood profiles that were started at their confluence with Deer Creek in the Oklahoma City Metropolitan Area and extended upstream into the City of Piedmont.

A Flood Insurance Study that analyzed flooding for the North Canadian River just downstream of the City of Yukon was prepared by the USACE, Tulsa District, in January 1972 (Reference 34). A restudy of that stream (Reference 35) was completed in 1977 in which the study limits were expanded to RM 295 to include the reach of the North Canadian River applicable to the City of Yukon. The Natural Resources Conservation Service (NRCS) (formerly the Soil Conservation Service) completed a Flood Insurance Study for the City of El Reno, the adjoining community to the west, in 1972 (Reference 36). The water-surface profile on the North Canadian River varies at the match line of the two studies. The 100-year water-surface elevation for this study is 1.8 feet higher than the NRCS study at the upper study limits or match line. In coordinating with the NRCS to establish profile concurrence, it was established that more recent Water Resources guidelines for frequency determinations along with 4 to 6 years of additional data and more detailed cross sections were used in the study.

As a result of the foregoing, agreement was reached by the FIA, the NRCS, and the USACE that the data presented in the study supersede that of previous analyses. The net effect is an increase in the 100-year flow with an accompanying increase in the 100-year water-surface elevation at the upper study limit.

A Detailed Project Report for Turtle Creek was completed by the USACE in October 1974 (Reference 37). The local protection plan would provide flood control for Turtle Creek by enlarging and straightening the stream channels. The project would provide protection from the 100-year- frequency flood on Turtle Creek. Some differences were noted in the water-surface profiles between the Detailed Project Report and the City of Yukon study. Generally, the differences are small and can be attributed to added period of record and additional data available.

A planning document (Reference 38) prepared by an Oklahoma City engineering firm addresses the aspects of planning necessary for community growth in the City of Yukon.

This FIS report either supersedes or is compatible with all previous studies in this report and should be considered authoritative for purposes of the NFIP.

8.0 LOCATION OF DATA

Information concerning the pertinent data used in the preparation of this study can be obtained by contacting FEMA Region VI, Federal Insurance and Mitigation Division, 800 North Loop 288, Denton, Texas 76209.

COMMUNITY NAME	INITIAL IDENTIFICATION	FLOOD HAZARD BOUNDARY MAP REVISION DATE	FIRM EFECTIVE DATE	FIRM REVISONS DATE
Calumet, Town of	April 9, 1976	None	January 1, 1992	None
El Reno, City of	August 17, 1973	None	December 31, 1974	October 8, 1976 June 29, 1979 August 12, 1980
Geary, City of	October 29, 1976	None	September 26, 2008	None
Mustang, City of	April 9, 1976	None	July 2, 1980	February 6, 1991
Okarche, Town of [1]	N/A	N/A	N/A	N/A
Oklahoma City, City of	July 14, 1972	None	December 31, 1974	July 2, 2002
Piedmont, City of	July 19, 1977	None	February 17, 1982	November 5,1997
Union City, Town of	January 14, 1977	None	January 19, 2000	None
Yukon, City of	May 24, 1974	June 18, 1976	September 28, 1979	None
Canadian County Unincorporated Areas	August 13, 1982	January 3, 1986	September 1, 1987	None

[1] No Special Flood Hazard Areas Identified

TABLE 6

FEDERAL EMERGENCY MANAGEMENT AGENCY

CANADIAN COUNTY, OK

AND INCORPORATED AREAS

COMMUNITY MAP HISTORY

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APPENDIX A

Each FIRM panel may contain specific notes to the user that provide additional information regarding the flood hazard data shown on that map. However, the FIRM panel does not contain enough space to show all the notes that may be relevant in helping to better understand the information on the panel. Figure 2 contains the full list of these notes.

Figure 2: FIRM Notes to Users

NOTES TO USERS

For information and questions about this map, available products associated with this FIRM including historic versions of this FIRM, how to order products, or the National Flood Insurance Program in general, please call the FEMA Map Information eXchange at 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA Flood Map Service Center website at msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the website. Users may determine the current map date for each FIRM panel by visiting the FEMA Flood Map Service Center website or by calling the FEMA Map Information eXchange.

Communities annexing land on adjacent FIRM panels must obtain a current copy of the adjacent panel as well as the current FIRM Index. These may be ordered directly from the Flood Map Service Center at the number listed above.

For community and countywide map dates, refer to Community Map History in this FIS Report.

To determine if flood insurance is available in the community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

PRELIMINARY FIS REPORT: FEMA maintains information about map features, such as street locations and names, in or near designated flood hazard areas. Requests to revise information in or near designated flood hazard areas may be provided to FEMA during the community review period, at the final Consultation Coordination Officer's meeting, or during the statutory 90-day appeal period. Approved requests for changes will be shown on the final printed FIRM.

The map is for use in administering the NFIP. It may not identify all areas subject to flooding, particularly from local drainage sources of small size. Consult the community map repository to find updated or additional flood hazard information.

BASE FLOOD ELEVATIONS: For more detailed information in areas where Base Flood Elevations (BFEs) and/or floodways have been determined, consult the Flood Profiles and Floodway Data and/or Summary of Non-Coastal Stillwater Elevations tables within this FIS Report. Use the flood elevation data within the FIS Report in conjunction with the FIRM for construction and/or floodplain management.

FLOODWAY INFORMATION: Boundaries of the floodways were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the FIS Report for this jurisdiction.

FLOOD CONTROL STRUCTURE INFORMATION: Certain areas not in Special Flood Hazard Areas may be protected by flood control structures. Refer to Section 4.3 "Non-Levee Flood Protection Measures" of this FIS Report for information on flood control structures for this jurisdiction.

PROJECTION INFORMATION: The projection used in the preparation of the map was State Plane Oklahoma North (FIPS 3501) Feet. The horizontal datum was NAD83, GRS1980 spheroid. Differences in datum, spheroid, projection or State Plane zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of the FIRM.

ELEVATION DATUM: Flood elevations on the FIRM are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same vertical datum. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at www.ngs.noaa.gov/ or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

Local vertical monuments may have been used to create the map. To obtain current monument information, please contact the appropriate local community listed in Table of this FIS Report.

BASE MAP INFORMATION: Base map information shown on the FIRM was provided in digital format by the Geo Information Systems department of the University of Oklahoma. For information about base maps, refer to Section 6.2 “Base Map” in this FIS Report.

The map reflects more detailed and up-to-date stream channel configurations than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables may reflect stream channel distances that differ from what is shown on the map.

Corporate limits shown on the map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after the map was published, map users should contact appropriate community officials to verify current corporate limit locations.

NOTES FOR FIRM INDEX

REVISIONS TO INDEX: As new studies are performed and FIRM panels are updated within Logan County, Oklahoma corresponding revisions to the FIRM Index will be incorporated within the FIS Report to reflect the effective dates of those panels. Please refer to page 2 of this FIS Report to determine the most recent FIRM revision date for each community. The most recent FIRM panel effective date will correspond to the most recent index date.

FLOOD RISK REPORT: A Flood Risk Report (FRR) may be available for many of the flooding sources and communities referenced in this FIS Report. The FRR is provided to increase public awareness of flood risk by helping communities identify the areas within their jurisdictions that have the greatest risks. Although non-regulatory, the information provided within the FRR can assist communities in assessing and evaluating mitigation opportunities to reduce these risks. It can also be used by communities developing or updating flood risk mitigation plans. These plans allow communities to identify and evaluate opportunities to reduce potential loss of life and property. However, the FRR is not intended to be the final authoritative source of all flood risk data for a project area; rather, it should be used with other data sources to paint a comprehensive picture of flood risk.

Each FIRM panel contains an abbreviated legend for the features shown on the maps. However, the FIRM panel does not contain enough space to show the legend for all map features. Figure 3 shows the full legend of all map features. Note that not all of these features may appear on the FIRM panels in Canadian County.

Figure 3: Map Legend for FIRM

SPECIAL FLOOD HAZARD AREAS: *The 1% annual chance flood, also known as the base flood or 100-year flood, has a 1% chance of happening or being exceeded each year. Special Flood Hazard Areas are subject to flooding by the 1% annual chance flood. The Base Flood Elevation is the water surface elevation of the 1% annual chance flood. The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights. See note for specific types. If the floodway is too narrow to be shown, a note is shown.*

Special Flood Hazard Areas subject to inundation by the 1% annual chance flood (Zones A, AE, AH, AO, AR, A99, V and VE)

Zone A — The flood insurance rate zone that corresponds to the 1% annual chance floodplains. No base (1% annual chance) flood elevations (BFEs) or depths are shown within this zone.

Zone AE — The flood insurance rate zone that corresponds to the 1% annual chance floodplains. Base flood elevations derived from the hydraulic analyses are shown within this zone.

Zone AH — The flood insurance rate zone that corresponds to the areas of 1% annual chance shallow flooding (usually areas of ponding) where average depths are between 1 and 3 feet. Whole-foot BFEs derived from the hydraulic analyses are shown at selected intervals within this zone.

Zone AO — The flood insurance rate zone that corresponds to the areas of 1% annual chance shallow flooding (usually sheet flow on sloping terrain) where average depths are between 1 and 3 feet. Average whole-foot depths derived from the hydraulic analyses are shown within this zone.

Zone AR — The flood insurance rate zone that corresponds to areas that were formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.

Zone A99 — The flood insurance rate zone that corresponds to areas of the 1% annual chance floodplain that will be protected by a Federal flood protection system where construction has reached specified statutory milestones. No base flood elevations or flood depths are shown within this zone.

Zone V — The flood insurance rate zone that corresponds to the 1% annual chance coastal floodplains that have additional hazards associated with storm waves. Base flood elevations are not shown within this zone.

Zone VE — Zone VE is the flood insurance rate zone that corresponds to the 1% annual chance coastal floodplains that have additional hazards associated with storm waves. Base flood elevations derived from the coastal analyses are shown within this zone as static whole-foot elevations that apply throughout the zone.

Regulatory Floodway determined in Zone AE.

OTHER AREAS OF FLOOD HAZARD

Shaded Zone X: Areas of 0.2% annual chance flood hazards and areas of 1% annual chance flood hazards with average depths of less than 1 foot or with drainage areas less than 1 square mile.

Future Conditions 1% Annual Chance Flood Hazard – Zone X: The flood insurance rate zone that corresponds to the 1% annual chance floodplains that are determined based on future-conditions hydrology. No base flood elevations or flood depths are shown within this zone.

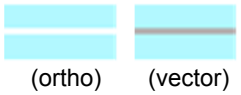
Area with Reduced Flood Risk due to Levee: Areas where an accredited levee, dike, or other flood control structure has reduced the flood risk from the 1% annual chance flood. **See Notes to Users for important information.**

OTHER AREAS

Zone D (Areas of Undetermined Flood Hazard): The flood insurance rate zone that corresponds to unstudied areas where flood hazards are undetermined, but possible.

Unshaded Zone X: Areas of minimal flood hazard.

FLOOD HAZARD AND OTHER BOUNDARY LINES



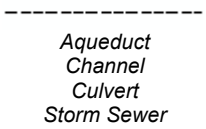
Flood Zone Boundary (white line on ortho-photography-based mapping; gray line on vector-based mapping)

Limit of Study

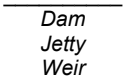
Jurisdiction Boundary

Limit of Moderate Wave Action (LiMWA): Indicates the inland limit of the area affected by waves greater than 1.5 feet

GENERAL STRUCTURES

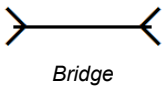


Channel, Culvert, Aqueduct, or Storm Sewer



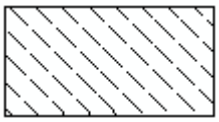
Dam, Jetty, Weir

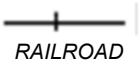
Levee, Dike, or Floodwall



Bridge

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AND OTHERWISE PROTECTED AREAS (OPA): *CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.* ***See Notes to Users for important information.***

 **CBRS AREA 09/30/2009**	Coastal Barrier Resources System Area: Labels are shown to clarify where this area shares a boundary with an incorporated area or overlaps with the floodway.
 **OTHERWISE PROTECTED AREA 09/30/2009**	Otherwise Protected Area
REFERENCE MARKERS	
22.0 ●	River mile Markers
CROSS SECTION & TRANSECT INFORMATION	
B 20.2	Lettered Cross Section with Regulatory Water Surface Elevation (BFE)
5280 21.1	Numbered Cross Section with Regulatory Water Surface Elevation (BFE)
17.5	Unlettered Cross Section with Regulatory Water Surface Elevation (BFE)
8 - - - - - - -	Coastal Transect
	Profile Baseline: Indicates the modeled flow path of a stream and is shown on FIRM panels for all valid studies with profiles or otherwise established base flood elevation.
	Coastal Transect Baseline: Used in the coastal flood hazard model to represent the 0.0-foot elevation contour and the starting point for the transect and the measuring point for the coastal mapping.
513	Base Flood Elevation Line
ZONE AE (EL 16)	Static Base Flood Elevation value (shown under zone label)
ZONE AO (DEPTH 2)	Zone designation with Depth
ZONE AO (DEPTH 2) (VEL 15 FPS)	Zone designation with Depth and Velocity
BASE MAP FEATURES	
Missouri Creek	River, Stream or Other Hydrographic Feature
234	Interstate Highway

	U.S. Highway
	State Highway
	County Highway
	Street, Road, Avenue Name, or Private Drive if shown on Flood Profile
	Railroad
	Horizontal Reference Grid Line
	Horizontal Reference Grid Ticks
+	Secondary Grid Crosshairs
Land Grant	Name of Land Grant
7	Section Number
R. 43 W. T. 22 N.	Range, Township Number
$^{42}76^{000m}$E	Horizontal Reference Grid Coordinates (UTM)
365000 FT	Horizontal Reference Grid Coordinates (State Plane)
80° 16’ 52.5”	Corner Coordinates (Latitude, Longitude)

Information concerning the pertinent data used in the preparation of this FIS Report can be obtained by submitting an order with any required payment to the FEMA Engineering Library. For more information on this process, see www.fema.gov.

Table 6 is a list of the locations where FIRMs for Canadian County can be viewed. Please note that the maps at these locations are for reference only and are not for distribution. Also, please note that only the maps for the community listed in the table are available at that particular repository. A user may need to visit another repository to view maps from an adjacent community.

Table 6: Map Repositories

Community	Building	Address	City	State	Zip Code
Calumet, Town of	Town Hall	118 West 2nd Street	Calumet	Oklahoma	73014
Canadian County Unincorporated Areas	County Commissioners Office	201 North Choctaw Ave	El Reno	Oklahoma	73036
El Reno, City of	County Commissioners Office	201 North Choctaw Ave	El Reno	Oklahoma	73036
Geary, City of	County Commissioners Office	201 North Choctaw Ave	El Reno	Oklahoma	73036
Mustang, City of	City Hall	135 North Mustang Road	Mustang	Oklahoma	73064
Okarche, Town of	Town Hall	103 West Oklahoma Street	Okarche	Oklahoma	73762
Oklahoma City, City of	Public Works Department	420 West Main Street, Suite 700	Oklahoma City	Oklahoma	73102
Piedmont, City of	City Hall	314 Edmond Street NW	Piedmont	Oklahoma	73078
Union City, Town of	Town Hall	102 Elm Street	Union City	Oklahoma	73090
Yukon, City of	Community Development Office	528 West Main Street	Yukon	Oklahoma	73099

Table 7: Listing of NFIP Jurisdictions

Community	CID	HUC-8 Sub-Basin(s)	Located on FIRM Panel(s)	If Not Included, Location of Flood Hazard Data
TOWN OF CALUMET	400268	11100301	40017C0200H 40017C0205H	
CANADIAN COUNTY UNICORPORATED AREAS	400485	11050002 11090202 11100301 11130302	40017C0025H 40017C0050H 40017C0070H 40017C0075H 40017C0100H 40017C0110H	

			40017C0120J 40017C0125H 40017C0130H 40017C0135H 40017C0140J 40017C0145J 40017C0175H 40017C0200H 40017C0205H 40017C0210H 40017C0215H 40017C0220H 40017C0230H 40017C0235H 40017C0240H 40017C0245H 40017C0255H 40017C0260H 40017C0265H 40017C0270H 40017C0325H 40017C0350H 40017C0360H 40017C0370H 40017C0375H 40017C0380H 40017C0385H 40017C0390H 40017C0395H 40017C0405H 40017C0415H 40017C0445H	
CITY OF EL RENO	405377	11050002 11090202 11100301	40017C0070H 40017C0100H 40017C0205H 40017C0210H 40017C0215H 40017C0220H 40017C0230H 40017C0235H 40017C0240H 40017C0245H	

			40017C0255H 40017C0265H 40017C0360H 40017C0380H 40017C0385H	
CITY OF GEARY	400381	11090202 11100301	40017C0025H 40017C0175H 40017C0200H	
CITY OF MUSTANG	400409	11090202 11100301	40017C0420H 40017C0440H 40017C0445H	
TOWN OF OKARCHE [1]	400428	11050002	40017C0100H	
CITY OF OKLAHOMA CITY	405378	11050002 11090202 11100301	40017C0120J 40017C0140J 40017C0145J 40017C0260H 40017C0265H 40017C0270H 40017C0280H 40017C0285H 40017C0290H 40017C0295H 40017C0405H 40017C0410H 40017C0415H 40017C0420H 40017C0430H 40017C0435H 40017C0440H 40017C0445H 40017C0505H 40017C0510H 40017C0530H 40017C0535H	
CITY OF PIEDMONT	400027	11050002	40017C0110H 40017C0120J 40017C0125H 40017C0130H 40017C0140J 40017C0145J 40017C0260H 40017C0280H	

TOWN OF UNION CITY	400334	11090202 11100301	40017C0370H 40017C0380H 40017C0385H 40017C0390H 40017C0395H 40017C0405H 40017C0415H 40017C0460H 40017C0480H 40017C0485H 40017C0505H	
CITY OF YUKON	400028	11100301	40017C0265H 40017C0270H 40017C0290H 40017C0410H 40017C0430H	